Digitalization of Judicial Electronic Archives using the Rational Unified Process Method with An Application Development Framework Using CodeIgniter (Case Study of Pengadilan Tinggi Agama Palembang)

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Abstract

The archiving process at the Pengadilan Tinggi Agama Palembang was still manual, where archive officers must prepare storage areas, sort and classify archives, put files into folders, and create archival data. The increasing number of archives and piling up in storage space makes searching for archives difficult and takes a long time in the process of searching for the required archives. The purpose of this research is to improve the existing system by designing a web-based archiving digitization application. In this research, the system development stage uses the Rational Unified Process (RUP) method with an application development framework using CodeIgniter. Based on the test results using the blackbox testing method, the system can display information on the decision archives graphically, the archive search process quickly, downloads the decision archive documents digitally, digital documents that have been separated by archive type and archive year, so it can be concluded that the archival information system with the application of information technology can facilitate work in processing, storing, reporting to obtain information and can then be used for decision making.

Keywords: archive, digital, codeigniter framework, RUP

1. INTRODUCTION

The development of technology today is very useful for agencies to search for information that is so fast, precise, and accurate. Computers are one of the tools to get that information effectively and efficiently. Prior to this computerized era, most users completed their work in a way that still used handwriting or manual recording methods[1]. Court archives are texts of decisions made and accepted by state institutions and government agencies, either singly or in groups, in the context of implementing government activities. Records management is a process of controlling records in a systematic, efficient, and effective manner which includes the creation, use and maintenance of records, as well as archive shrinkage. The purpose of archive management, apart from being a statutory

order, is also carried out in order to maintain the integrity, security, and safety of archives as well as the availability of information[2].

Archive digitization is a form of part of the process of how to change analog information media to digital media, which aims to maintain and preserve archives and maintain accessibility that can provide more access to the public, with the aim of being research material, notification and documentation[3]. The goal with digitizing archives is that they can become the solution for saving archives for the long term and saving archives is the process of digitizing from paper forms with the help of a camera set on a flatbed table or flatbed equipment scanners[3]. The importance of maintaining digital archives, namely information technology continues to develop, more and more archives require large space, various types of information technology appear. Digitizing archives has the following advantages: saving costs and space, simplifying the storage process, preserving the original source, simplify management so it can be found quickly when needed, dissemination or dissemination of information is more practical, easy to copy and back up data, more interactive (multimedia content)[4].

All the above archive digitization concepts will be able to be built programmatically using the codeigniter framework. CodeIgniter is a php framework that is open source and uses the MVC (Model, View, Controller) method to make it easier for developers or programmers to build a web-based application without having to create it from scratch[5]. The following is the structure of the codeigniter file and the concept of the MVC flow which can be seen in Figure 1 below.
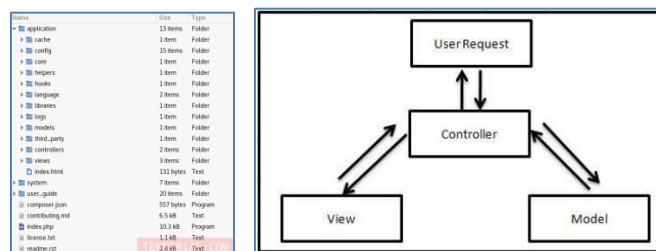

Figure 1. Codeigniter File Structure and MVC Flow Concept

The points that make CodeIgniter superior to other frameworks were speed, easy to adapt and modify, clear and complete documentation, and easy to learn. Judging from Figure 1 above, the model is a program in the form of an OOP class that is used to connect with the MySQL database as well as to manipulate it (input-edit-delete), the view is the program code in the form of a template or PHP to display data in the browser, the controller is the program code in the

form of OOP class that is used to control the flow or in other words as a model and view controller.

In the management of archives at the Pengadilan Tinggi Agama Palembang, related to archiving court decisions, they still use a manual process, such as the results of reports of litigation decisions, reports of inheritance decisions, joint assets and divorce divorces. The archive management process starts from; 1) prepare archive storage areas, filing cabinets, partitions and folders; 2) sorting and grouping archives by code and problem; 3) Putting the archive into a hanging folder and placing it in a filing cabinet; 4) create labels according to the problems contained in the archive; and 5) make dynamic archive data active. The problems that arise are increasingly complex because considering the increasing number of archives piling up in the storage space so that it will take time both in the process of searching for the archives needed, as well as energy to search for these archival documents, the process of managing and storing archives, especially at the Pengadilan Tinggi Agama Palembang, should be has implemented the implementation of the process of managing and storing archives based on information systems that can facilitate archiving activities.
This development is also in accordance with Law Number 14 of 2008 Article 7 Paragraph 3 concerning public information disclosure which mandates that every Public Agency must build and develop an information and documentation system to manage Public Information properly and efficiently so that it can be accessed easily[6].

To overcome this, a more integrated web-based system was created with the codeIgniter framework which will be built with the system development stage using the Rational Unified Process (RUP) method. The RUP method is a development method iterative and incremental software and focuses on architecture. The RUP method can be deal with the risks associated with development of system requirements based on changes desired by the client. For reducing this risk is done by testing at the end of each stage of the RUP, so that it will be easy to make changes before reach the final stage. RUP method too prioritizing user satisfaction so that more often interact with users[7].

This application will use a computerized system by entering a decision letter and looking for a decision letter to make it easier for employees. Based on previous research, the design of a web-based archival information system concludes that the application of the use of a web-based archival information system really helps facilitate organizational work[8][9][10]. Likewise with other studies that the design of a web-based archive information system using the CodeIgniter framework can manage the recording of incoming mail, outgoing mail, mail search, and archive storage digitally, so as to minimize the loss of archives that are vulnerable to archiving events[11][12].
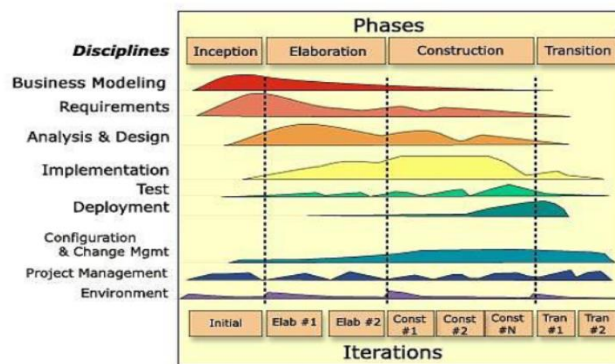
2.   METHODS

Making designs using the tools and materials used include hardware, software and other supporting materials including the operating system windows, xampp as web server and web database. The data collection method is a method that directly observes the object of research, namely by:

1) Observation with the aim that information about the system that are currently running can be directly identified.
2) Interviews; namely direct question and answer activities to the head and the administrative section of the Pengadilan Tinggi Agama Palembang.
3) Library Research: namely literature study is a technique of collecting data by looking for information and studying references in the form of documents or related files with the relevant data.
4) Similar studies: namely the exposition of research that has been carried out related to theory as a comparison material in research.

The method used in designing and building this system is the Rational Unified Process (RUP). There are several stages of software development contained in the RUP, namely:

1) Inception: this stage is in the form of requirements documents and Usecase models, which are used to determine the identification process of external entities that interact with the system.
2) Elaboration: Stages of analyzing the entire system to provide architecture, which is a use-case model, an executable architectural prototype.
3) Construction: the stage that includes the implementation of the previous design in the form of a software product, the concept of digitizing archives will be built programmatically using the codeigniter framework
4) Transitions; the stage of releasing software as an activity required to deliver the software to users[13].

The stage used in this method can be seen in Figure 2 below.

Source: R. Perwitasari, R. Afawani, and S. E. Anjarwani, 2020
Figure 2. RUP Method Architecture

The final product of the system that has been built will be tested using the black box method , where this test will see how feasible the system can be used and in accordance with the objectives of the system development itself[14].

3. RESULTS AND DISCUSSION

The archive is an administrative track record tool for an incident that is the subject of accountability so that it plays a broad role for an agency or organization[15]. Archives become the center of memory in humans because the existence of archives can be a history[16]. Records management really needs continuous development along with the increasing complexity of archives every time[17]. This development is carried out to be able to back up archives from all threats, damage, or loss by utilizing information systems. The advantages of digitizing activities are to avoid document damage, storage space efficiency, and as a copy of archives. The order of digitizing the archive consists of preparing the documents to be inputted. Documents are scanned, prepare folders on the computer according to the name of the document being inputted [18]. Officers who are directly related to the process in the system should be people who have an educational background in the field of archive management or those who have expertise from previous experience, so that they will obtain optimal performance. Information data on decisions at the Pengadilan Tinggi Agama Palembang recorded from 2019 to 2021 were 20,340,273 decisions with details as follows in Table 1:

Table 1. Total Archives of PTA Palembang Decisions; 2019, 2020 and 2021

Year	Total Judgment Archive
2019	6.682.014
2020	9,472,836
2021	4,185,422

Source: PTA Palembang, 2022

Based on the stages in software development contained in the RUP stage, it can be explained as follows:

3.1 Inception

This stage is more on modeling the required business processes and defining the need for the system to be made. Based on the results of observations made by researchers at the Pengadilan Tinggi Agama Palembang, currently various decision files still apply manual processes, such as the results of reports on divorce decisions, inheritance decisions, joint assets, and divorce reports. The archive management process starts from 1) preparation of both the style and the archive storage area, 2) classifying documents according to the code and the subject of the decision, 3) the process of entering the archive in the place that

has been made, 4) coding the archive according to the decision problem, 5) making data dynamic archive is active. The existing business processes are described as follows. The procedure for managing the previous year's decision archives at the Pengadilan Tinggi Agama Palembang can be seen in Figure 2.
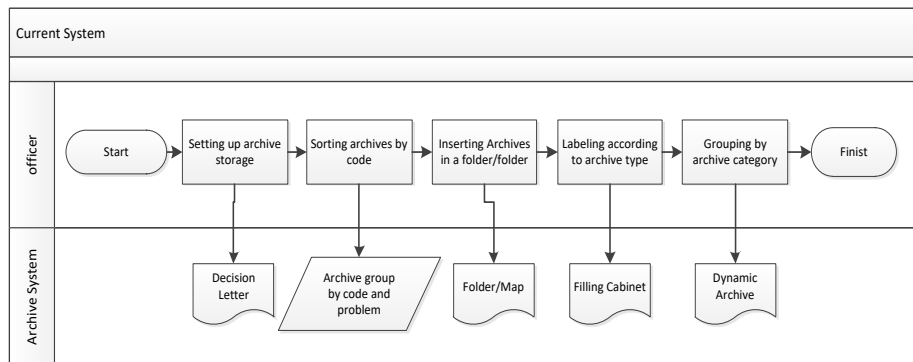

Figure 3. Progress of PTA Palembang archive management

To find out system requirements, the author uses an analysis of functional requirements and non-functional requirements that describe the services, features or functions that will be provided on the archive digitization system built with numbering based on the Software Requirements Specification (SRS) see Table 2 following.

Table 2. Functional and Non-Functional Needs

No. SRS	Description
SRS-01	The system is able to manage user data : add user, edit user, delete user
SRS-02	The system is able to add or reduce archive types
SRS-03	The system is able to digitally accommodate archive data based on the type of archive
SRS-04	The system can change data, delete archive data
SRS-05	The system can download digital archive data
SRS-06	The system can search archives based on the subject/year/team of judges handling the case/applicant and respondent
SRS-07	The system is able to display total archive information by archive type
SRS-08	The system is able to display total archive information with graphs
SRS-09	The system is able to display the grouping of archives based on the year of filing
SRS-10	The system is able to display information based on the type and year of filing
SRS-11	The available system can be repaired at any time and is able to operate 24 hours per day
SRS-12	The system developed later must have a high level of ergonomics so that it is attractive to be accessed by users anywhere (*web-based*).
SRS-13	The system developed has a security level where every user who accesses cannot change the data in this system arbitrarily

3.2 Elaboration

At this stage, modeling was carried out using the Unified Modeling Language (UML). UML is used for visual modeling that is used as a means of object-oriented system design by using diagrams including use case diagrams used to get the functional requirements of a system, activity diagrams describe how activities occur in the system, and class diagrams provide an overview of the relationship between tables existing in the database[19]. The design of this use case diagram is explained through Figure 3. Use case diagram in Figure 3 illustrates user interaction with the application to be built. Users involved in the system consist of 3 (three) actors, namely related parties (applicant and respondent in the decision), admin/system operator, and leaders who are able to view up-to-date information.
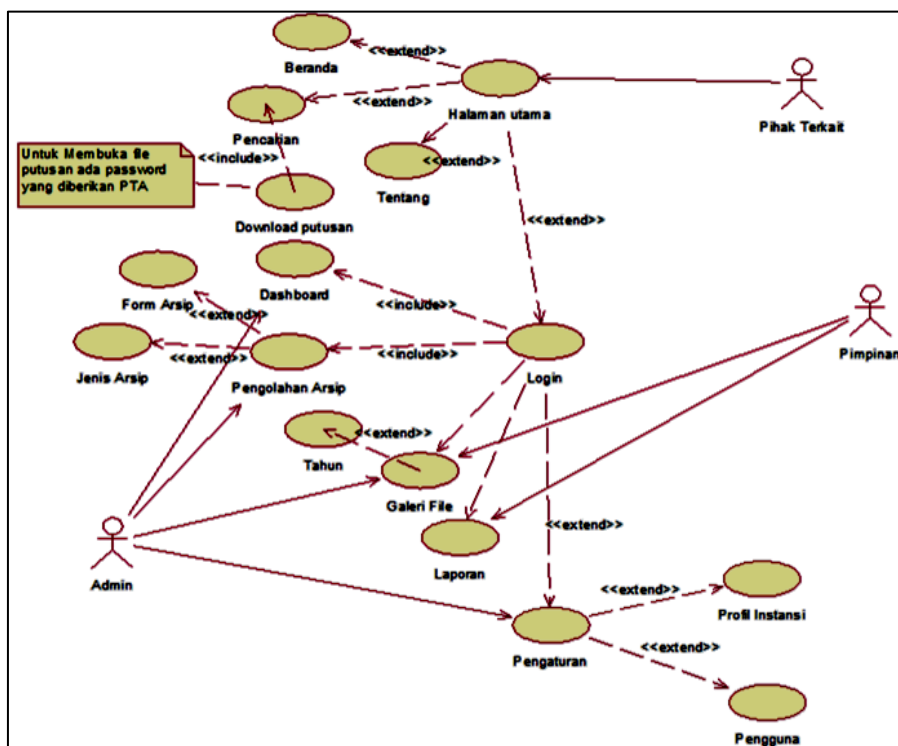

Figure 3. Usecase Diagram of PTA Palembang digital archive management

Activity diagram that describes the activities of the three actors in the system can be seen in Figure 4, Figure 5, and Figure 6 below.
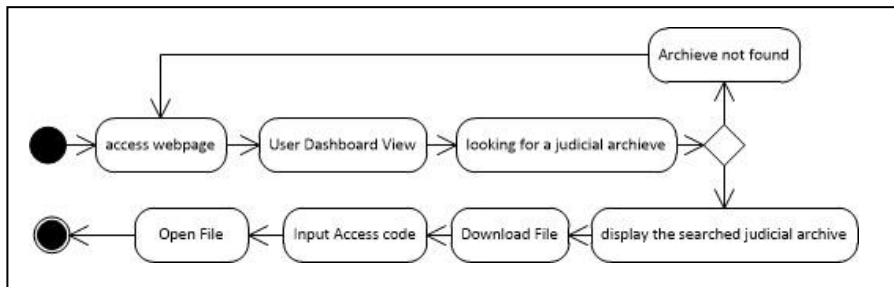
Figure 4. Activity Diagram of User

In Figure 4 above, the user to access the judicial archive can perform the search process. The system can search for archives based on subject/year/team of judges handling the case/applicant and respondent. To open the file, the user must first enter the archive passcode.
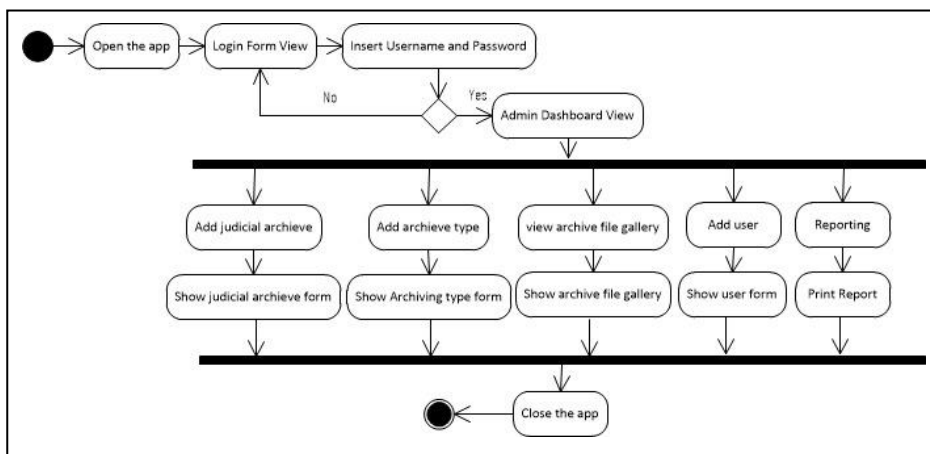

Figure 5. Activity Diagram of Admin/System Operator

In Figure 5 above where the admin performs the process of adding the judicial archive by entering the data of the applicant and the respondent, the year of filing, the type of file, the team of judges handling the case, and the decision file. Other processes are adding archive types, adding new users, and reporting.
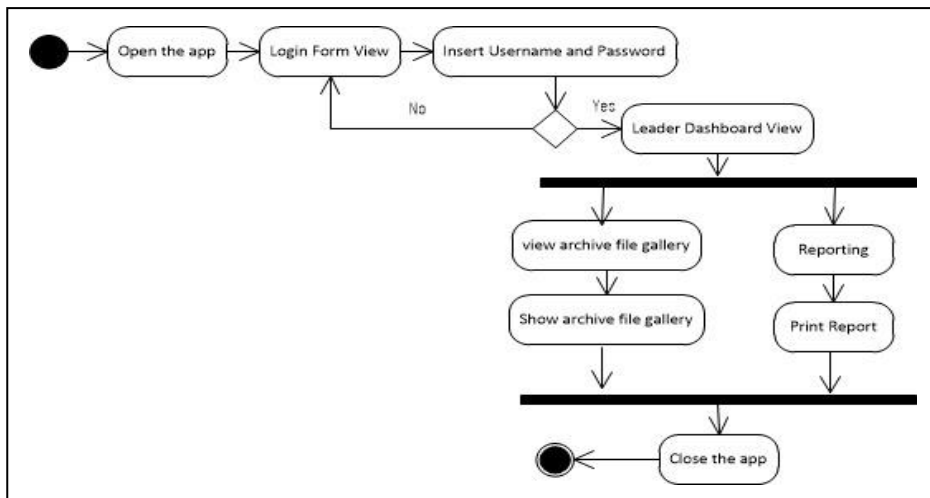
Figure 6. Activity Diagram of Leadership

In Figure 6 above, leadership access can view statistics and archive information that has been carried out by the admin including statistics on the number of records by year and by type of archive in the form of graphs and numbers.

Figure 4, 5, 6 above, each actor has a different activity, where the admin/system operator and the leader are required to login to manage and view information about archives digitally, while related parties such as the requester and the respondent do not require login access. Furthermore, the class diagram explains the database used in terms of defining what tables are used in making the system development. For more details, see Figure 5 below:
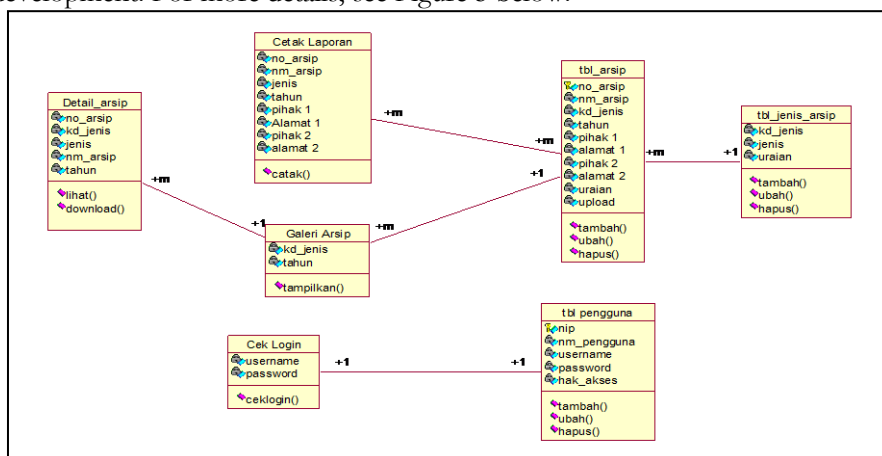

Figure 5. Archive Digitization Class Diagram

3.3 Construction

This stage contains the application of the previous design in the form of a software product along with a user guide. The resulting software is a system that accommodates the needs of PTA Palembang in digitizing the decision archives electronically. The main page display provided to related parties includes information on the decision archives graphically, the archive search process, downloading the decision archive documents, digital documents that have been separated by archive type and archive year. The main page display for related parties can be seen in Figure 6.
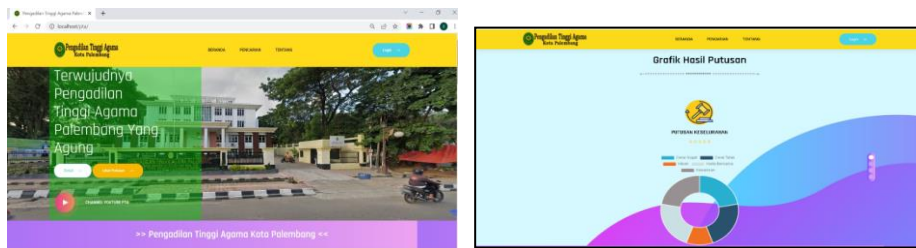

Figure 6. Main View for Related Parties

While the display for decision archive information, archive search process, download decision archive documents, digital documents that have been separated by archive type and archive year can be seen in Figure 7 below.
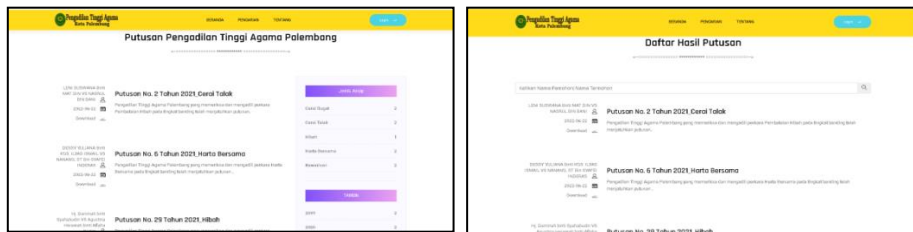

Figure 7. Judgment Archive Information Display

The process of managing court records digitally cannot be separated from the role of PTA Palembang officers in this case having the task of being a system admin with the role of managing records starting from the process of adding, repairing, and deleting data. In addition, viewing archive reports based on the type and year of archives that can be submitted to leaders in need. The following view of the process carried out by the admin can be seen in Figure 8.
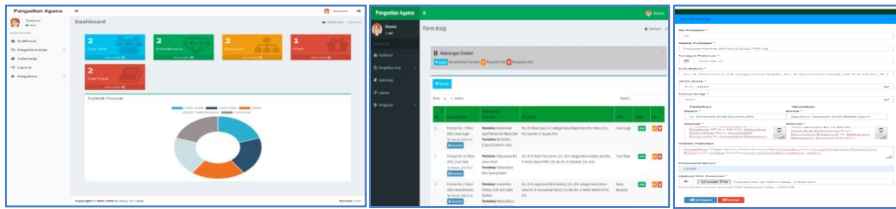
Figure 8. Admin Task Display in Court Archive Management Process

3.4 Transition

The stages of releasing software as an activity required to place the software to users in this study are placed locally first by setting up the server side and client side, so that this system before going online can function properly and survive from the security side. In the future, if the system is actually declared feasible, hosting and domains will be prepared to be able to access this system. Based on the results of system testing, the system is running well and all activity buttons are running as needed. The following table 3 presents the test results using black box testing. The black box testing method is a method used in testing a software without having to pay attention to the details of the software. This test tries the program that has been made by entering data on each form and is needed to find out whether the program is running as required by the company or not[20].

Table 3. Test Results with Blackbox Testing

No. SRS	Description	Expected results	Test results	Conclusion
SRS-01	The system is able to manage user data: add user, edit user, delete user .	The process is successful and the button is working	In accordance	(√) Normal ( ) Not
SRS-02	The system is able to add or reduce archive types	The process is successful and the button is working	In accordance	(√) Normal ( ) Not
SRS-03	The system is able to digitally accommodate archive data based on the type of archive	The process is successful and the button is working	In accordance	(√) Normal ( ) Not
SRS-04	The system can change data, delete archive data	The process is successful and the button is working	In accordance	(√) Normal ( ) Not
SRS-05	The system can download digital archive data	Download process works	In accordance	(√) Normal ( ) Not
SRS-06	The system can search archives based on the subject/year/team of judges handling the	Search process is working	In accordance	(√) Normal ( ) Not

No. SRS	Description	Expected results	Test results	Conclusion
	case/applicant and respondent			
SRS-07	The system is able to display total archive information by archive type	The process of information and buttons is successful and works	In accordance	(√) Normal ( ) Not
SRS-08	The system is able to display total archive information with graphs	The process of information and buttons is successful and works	In accordance	(√) Normal ( ) Not
SRS-09	The system is able to display the grouping of archives based on the year of filing	The process of information and buttons is successful and works	In accordance	(√) Normal ( ) Not
SRS-10	The system is able to display information based on the type and year of filing	The process of information and buttons is successful and works	In accordance	(√) Normal ( ) Not
SRS-11	The available system can be repaired at any time and is able to operate 24 hours per day	Online within 24 hours	Offline	
SRS-12	The system developed later must have a high level of ergonomics so that it is attractive to be accessed by users anywhere (web-based).	Have an attractive appearance	In accordance	(√) Normal ( ) Not
	The system developed has a security level where every user who accesses cannot change the data in this system arbitrarily	Login successfully, if the username and password do not match, I will send a message	In accordance	(√) Normal ( ) Not

4. CONCLUSION

Based on the research results, it can be concluded that: 1) the RUP method used in designing and building a judicial electronic archive digitization system can

reduce the risk of changes desired by PTA Palembang because it is tested at the end of each stage to achieve the goal and prioritize user satisfaction so that this research interacts with users more often, 2) Using the CodeIgniter Framework to develop web-based applications can make it easier to release without having to build from scratch, 3) Digitizing archives that are built can display decision archive information graphically, search archives quickly, download decision archive documents digitally, digital documents that have been separated by archive type and archive year, so it can be concluded that the archival information system with the application of information technology can facilitate work in processing, storing, reporting to obtain information and can then be used for decision making.

REFERENCES

[1]   R. Tulhawa and R. Fajriah, "Analisa Dan Perancangan Sistem Informasi Penjualan Dan Pengelolaan Barang Berbasis Web (Studi Kasus: Butik Anne Riani," *Jukomika*, vol. 2, no. 3, pp. 122–129, 2019.

[2]   dkk M. R. Rahman, "Pengadilan Tata Usaha Negara Makassar Management Of Case ' S Archives In The Court For Access To Public Information At The Administrative," vol. 3, pp. 155–170, 2020.

[3]   D. Sugiharto, "Penyelamatan Informasi Dokumen/Arsip di Era Teknologi Digital," *Baca*, vol. 31, no. 1, pp. 51–64, 2010.

[4]   P. W. Atmoko and M. Si, "Digitalisasi dan Alih Media," *Malang Univ. Bramelati*, 2015.

[5]   M. Destiningrum and Q. J. Adrian, "Sistem Informasi Penjadwalan Dokter Berbassis Web Dengan Menggunakan Framework Codeigniter (Studi Kasus: Rumah Sakit Yukum Medical Centre)," *J. Teknoinfo*, vol. 11 no 2, p. 30, 2017.

[6]   Undang-Undang RI, "Undang Undang Republik Indonesia Nomor 14 Tahun 2008 tentang Keterbukaan Informasi Publik," 2008.

[7]   R. Perwitasari, R. Afawani, and S. E. Anjarwani, "Penerapan Metode Rational Unified Process (RUP) Dalam Pengembangan Sistem Informasi Medical Check Up Pada Citra Medical Centre," *J. Teknol. Informasi, Komputer, dan Apl.*, vol. 2, no. 1, pp. 76–88, 2020.

[8]   M. Putri, H. Hn, N. Martiani, and H. G. Prasetiyo, "PENGARUH PELATIHAN PEGAWAI TERHADAP KINERJA PEGAWAI BADAN SIBER DAN SANDI NEGARA."

[9]   N. Naofal, M. R. D. Ulhaq, and C. Prianto, "Development of E-Commerce Information System at Az-Zahra Shop Using Laravel Framework," *JOMLAI J. Mach. Learn. Artif. Intell.*, vol. 1, no. 1, pp. 95–106, 2022.

[10]   I. D. A. Al Faaizi, M. B. Sanjaya, and R. Budiawan, "Aplikasi Pengelolaan Data Arsip Di Kelembagaan Kantor Kecamatan Bojongsoang," *eProceedings Appl. Sci.*, vol. 5, no. 2, 2019.

[11]   T. N. Lina, M. S. Rumetna, F. G. J. Rupilele, A. N. S. Palisoa, and M. Z. Sirajjudin, "Sistem Informasi E-Arsip Berbasis Web (Studi Kasus: PT Haleyora Powerindo Cabang Sorong)," *J. Jendela Ilmu*, vol. 1, no. 1, pp. 1–5, 2020.

[12]   N. Firdaus and D. Irfan, "Rancang Bangun Sistem Informasi Arsip Berbasis Web Menggunakan Framework Codeigniter," *Voteteknika (Vocational Tek. Elektron. dan Inform.*, vol. 8, no. 1, pp. 44–52, 2020.

[13]   and M. M. T. Tia, I. Nuryasin, "Simulasi Rational Unified Process (RUP) Pada Pegembagan Perangkat Lunak," *J. Repos*, vol. 2 no 4, p. 485, 2020.

[14]   and S. S. U. Hanifah, R. Alit, "Metode Black Box Pada Pengujian Sistem Informasi Surat Keluar Masuk," *SCAN - J. Teknol. Inf. dan Komun*, vol. 11 no 2, pp. 33–40, 2016.

[15]   M. R. Hendrawan and M. C. Ulum, *Pengantar Kearsipan: Dari isu kebijakan ke manajemen*. Universitas Brawijaya Press, 2017.

[16]   M. Fathurrahman, "Pentingnya arsip sebagai sumber informasi," *JIPI (Jurnal Ilmu Perpust. Dan Informasi)*, vol. 3, no. 2, pp. 215–225, 2018.

[17]   P. Nusantara, "MODEL MANAJEMEN DATA PADA PENGELOLAAN ARSIP ELEKTRONIK: PENERAPAN DATA MANAGEMENT BODY OF KNOWLEDGE," *J. Kearsipan*, vol. 13, no. 1, pp. 55–76, 2018.

[18]   Sambas Ali Muhidin dkk, "Pengelolaan Arsip Digital," p. 416, 2016.

[19]   A. Voutama, "Sistem Antrian Cucian Mobil Berbasis Website Menggunakan Konsep CRM dan Penerapan UML," *Komputika J. Sist. Komput.*, vol. 11, no. 1, pp. 102–111, 2022.

[20]   N. H. Lestamanta, "Pengujian Aplikasi Rumah Sidoarjo Menggunakan Blackbox Testing," 2022.