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Digitizing Master Engineering Documents

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Abstract

The main function of division Master Engineering Documents of the Design and Development Department is to store and maintain technical documents for all PGs. The work will increase every year, the documents stored will also continue to grow. The large number of documents in the form of hard files stored in the "Dokumen Teknik Induk" building makes it difficult for staff in the management process, both when searching for documents and maintaining them. In the document management process, it is necessary to have a master data that can accommodate all soft file documents. In addition to facilitating the process of data maintenance and document management, the existence of a master data document in the form of a softfile will make it easier for staff during the document search process according to user needs, the data distribution process will also become more effective. "Digitizing Master Engineering Documents" application is intended to convey aspirations / complaints about problems in the need of engineering documents in PT Petrokimia Gresik stakeholder environment. Archive digitization is a digital document storage system. Because it is done digitally, e-archive is done using technology such as computers, recording devices, servers, and other devices. The development of the world of information and communication technology (ICT) today has brought the world into industry 4.0. This era is marked by the abundance of data and information, cyber physical systems, to the management of big data. For information workers including archivists this is something that must be anticipated from the start because the landscape can be completely different from what exists today.

Keywords
master engineering documents; digitization; records; PT petrokimia gresik

I. Introduction

The development of internet technology today makes various services available physically available online. Technological developmentwhich is getting faster can also bring us to achieve the development goals sustainable (achieving the Sustainable Development Goals). One of the goals of SDGs 2030 are "Building" Resilient Infrastructure, Improve Inclusive and Sustainable Industries, and Encouraging Innovation". There is target to achieve namely to support development domestic technology, research and innovation in developing countries. The application of information technology is visible from the application of e-Firm in the field of company that can improve firm performance so that more advanced and able to bring about change. One of the applications that can help manage data in paperless use digital technology.

Development is a systematic and continuous effort made to realize something that is aspired. Development is a change towards improvement. Changes towards improvement require the mobilization of all human resources and reason to realize what is aspired. In addition, development is also very dependent on the availability of natural resource

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wealth. The availability of natural resources is one of the keys to economic growth in an area. (Shah, M. et al. 2020)

Sustainable Development Goals (SDGs) is a term that describes a global development program that is targeted to end in 2030. The development goals in the SDGs program consist of 17 points, namely: No Poverty, No Hunger, Health, Education, Gender Equality, Sanitation and Access to Clean Water, Clean and Affordable Energy, Economy and Decent Work, Industry, Innovation and Infrastructure, Reducing Inequality, Sustainable Cities and Communities, Responsible Consumption and Production, Climate Change Action, Water Ecosystems, Land Ecosystems, Peace, Justice and Strong Institutions, and Partnerships to Achieve Goals.

According to paper from Mogot and Husnita, the principles for implementing the SDGs, as quoted from the https://www.icctf.or.id/sdgs/ page), are:

a) Universal: implemented by the whole world related to transformative, human-centered, comprehensive and long-term goals and objectives
b) Integration: implemented in an integrated manner on all social, economic and environmental dimensions (interrelated)
c) No-One Left Behind: Implemented by involving all stakeholders and benefiting all especially the vulnerable.

As stated in the SDGs Logo below:

Source: https://www.un.org/sustainabledevelopment/

***Figure 1**. Sustainable Development Goals (SDGs) Logo*

Implementation of the first point of SDGs. In implementing the first point of the SDGs, libraries need to provide the widest possible range of services. The scope of library services is intended to open up opportunities for the wider community to use the library. So, it is hoped that the library services can provide benefits to the community as a whole without exception.

In firms, library can build from the number of documents stored in the "DokumenTeknikInduk/Doktekin". Find many documents (master technical documents) sometimes have difficulty according to user requests, because the search system is still manual. Process flow for image scan requests and image borrowing which is still done manually. And there is no record for user data that asks for scans or prints images. Document recap reports, both incoming and borrowed documents, still use excel so they can potentially be lost or deleted. Managers cannot monitor loan reports and request scanned images at any time.

Digitization is the process of creating a digital image and then presenting it on a computer, local area network or the Internet. All forms of internal storage various media, whether magnetic, optical, as well as static images, customize on technological

developments. However, the manufacturer is not able to guarantee media viability in the long-term long time. This process requires archival practitioners working together with IT practitioners to analyze technological change with a long-term planning blueprint in the context of digitizing documents/ files. The process of technological development will continue to move as if it is impossible to catch up, technology will continue to move forward with products that are always up to date with changes in generations from time to time. So, the impact of the change was so great that out-of-date products were out of sync with the latest products, because each new product was confirmed to have different specifications.

Along with advances in technology, the world of archives which so far only dwells on shabby and smelly papers. Now also do not miss the use of technology as a tool for processing, accessing and distributing and preserving archives. Ancient archives that have historical information value and contain very interesting uniqueness have now been presented and accessed through electronic media. By enabling wider access, it is hoped that archives are evidence that is at the same time able to talk about historical facts and events and be able to provide meaning and benefit in human life. So that archives that were previously only visible and readable in archive centers, can now be accessed online, and even the services have led to an automated service system.

Through the digitization of archives, matters relating to government, institutions and organizations will become simpler with everyone being able to always carry their archives with them in a data processing device that is always at hand (hand-phone). At the same time, the archiving service process can be carried out quickly, it is enough to use data processing and storage tools that do not take up too much space but have a large capacity (big data). The tool (computer) is enough to be placed on a table with sufficient capacity to accommodate documents in one large warehouse. Through the digital system, there will also be energy, time and place efficiency in managing records and providing archival services.

According to the Glossay of Library, archives are collections of historical records written on paper or other media that are stored in an orderly place. The historical records are in the form of legal-formal documents that describe the administrative history, commercial/business, social and political activities of a person/organization archives can also be in the form of texts made and accepted by state institutions and government agencies in any form, either singly or in groups, in the context of implementing government activities; texts made and accepted by private bodies and/or individuals, in any form, either singly or in groups, in the context of implementing national life.

II. Review of Literature

At the beginning of the Reformation, the government gave acknowledgment to the activity of transferring archived media, which was stated in Government Regulation Number 88 of 1999 concerning Procedures for Transferring Company Documents into Microfilm or other Media and Legalization. Through this regulation, there is a transfer of archival media from paper to micro film and other media such as compact disks (CDs).

Along with its development, the idea of electronic archives emerged where archiving activities were transferred to electronic media. In addition to facilitating the management, filing, storage and disbursement of archives, it is also intended that internal archive activities are carried out automatically. Thus, an activity known as the creation of electronic archives and automation is carried out. Electronic and automated creation is the

creation of electronic archives using electronic devices, such as digital cameras, voice recorders, video recorders and especially computers. Furthermore, archival activities have shifted to digital archive. This is done through the process of digitizing conventional archives into digital media, with the main aim of protecting archives from physical damage.

As an illustration of the implementation of archive digitization, here are the minimum steps that must be taken by transferring archive media from paper media to electronic media, which is the first step before entering online archive digitization. Based on this, the authors view that the digitization of archives has become a demand for world development, and must be immediately implemented in government offices, especially after the policy on an Electronic-Based Government System, for the sake of (1) efficient archive management in order to achieve efficient governance; and (2) acceleration of the archive service process in order to improve optimal services for archive creators and users. Closing Based on the discussion above, the results can be formulated that archive digitization is a demand for the times that have entered the era of the industrial revolution 4.0. Archive digitization is very useful in the context of efficient archive management which takes up a lot of place, time, budget and energy in conventional systems. Digitizing archives is also very useful in order to accelerate the service process for archive creators (government/organizations/individuals) and the public using archive services

The architecture of the Master Engineering Document Digitization system is as follows:

Figure 2. *The Architecture Digitization Master Engineering Document*

The vision for digitizing master engineering documents:

a. optimizing the classification of documents on the system so as to make it easier for staff in the document search process.
b. providing convenience to users in the document access process through the system, as well as the document saving and loan data recap process can be recorded automatically through the system so that staff are easier in the document control process and the manager/VP can monitor every time through the system.
c. optimizing the process of both storing and borrowing / scanning documents.

III. Research Method

The methodology used in this study consists ofliterature related to the issues raised (in this case the master document). The use of literature is useful in obtaining appropriate information and there is relevance between mutually supporting information. In making digitizing master engineering documents application, the author uses the System method Development Life Cycle (SDLC) as shown is in Figure 3.

Figure 3. *System Development Life Cycle (SDLC) (NYS Project, 2018-[8])*

In Figure 3, is the flow of stages the method used in carrying out development of the "digitizing master engineering documents" application. Application "digitizing master engineering documents" only focuses on the stage design or to the design stage. The stages of application development "digitizing master engineering documents" this using System the Development Life Cycle (SDLC) is as following:

Requirements Analysis. This stage collects all needs or requirements of a system that allows users to understand system business processes and get clear picture of the system. In "digitizing master engineering documents" application development, begins from identifying problems that appears on the running system. Currently, there are still many complaints community that has not been conveyed with both to firm agencies. In general, when community have complaints about things that happens in the working area must go to office. Besides that, complaints submitted to design and building staff is not necessarily conveyed to the party's ward. Don't forget also when people submit complaints, it was not handled quickly so that it can harm a lot of people.

Design. After analyzing thethe existing problems, therefore you cancarried out the design of the design of which product by doing designing a prototype design of "digitizing master engineering documents" application.

IV. Result and Discussion

4.1 Application Features

The following is the result of the design "digitizing master engineering documents" application, from application features, workflow application and application display.

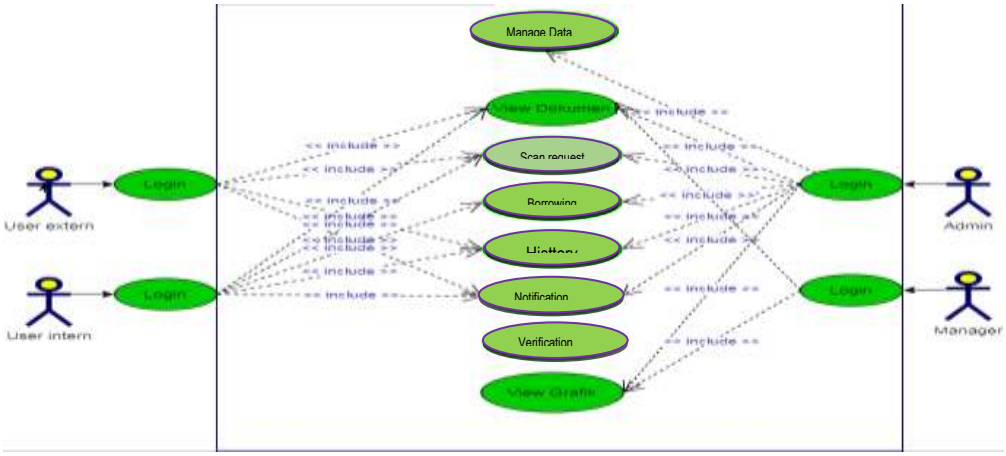

Figure 4*. Workflow Application*

Major features, contains :

1) Home page
   – This feature is used to distinguish the user's access rights to the application, so that the data and features in it can only be opened by the user according to the login session.
2) Dashboard
   – Displays the main page of the website.
3) Document Data
   – This feature is used to display all document data based on their classification. Accompanied by a scan and borrow button.
4) Document Search
   – This feature is used for users in searching documents using keywords.
5) Scan request report
   – This feature is used to display the document scan request report data from the user.
6) Request report
   – This feature is used to display document request report data by staff.
7) History
   – This feature is used to display the history of scan requests and borrowings for each user, so this page is different for each user (user).
   – This feature is used to display historical data of all users who access the website (admin).
8) Verification
   – This feature is used by the admin to give notification to the user that the request for scan/borrowing of documents is approved and ready to be followed up by the Doktekin staff.
9) Notification
   – This feature is used as a reminder for related users when there is information from the admin regarding documents that you want to scan/borrow. This feature is also useful for admins when there is information from a user who submits a document scan/borrow request.
10) Scan request graph
   –This feature serves to make it easier to see the total scan requests each month.
11) Document request chart
   –This feature is used so that the related unit Manager can verify the project more effectively.
12) User visit graph
   −This feature serves to see the total number of users who visit the website every month.

4.2 Release Scope

The schedule & release plan of each feature is planned as follows:

Table 1. Application Schedule & Release Plan

Features	**Release 1** **Month 1-2**
Home Page	
Login Page	

Features	Release 1 Month 1-2
Dashboard	Fully implemented
DocumentData	
DocumentData (CRUD admin)	Fully implemented
DocumentSearching	
Report (admin)	
ScanRequest Report	Fully implemented
Request Report	
History	
History (user)	Fully implemented
History (admin)	
Verification	
Verification	Fully implemented
Notification	
Notification	Fully implemented
Graphic	
Scan Request Graphic	Fully implemented
DocumentRequest Graphic	
UserVisit Grafik	

4.3 Limitation and Exclusion

This project does not include the following:

– This system only covers for borrowing and receiving documents, not including document numbering.
– Scanner.

Table 2. Limitation and Exclusion

What Is	What Is Not
Bisnis Area / Bisnis Proses	
• Refer to business need	• N/A

What Is	What Is Not
High Level Functional Requirement	
• Refer to section major features above. • Login use“digital office” application.	• N/A
High-Level Non-Functional Requirement	
• Can access 24/7 • Estimated number of users is a maximum of 2000 users, from several roles (departmental users, vice presidents, and admins). • The web must be secure & accessible both via the intranet and the internet. • Capacity can be increased quickly if needed. • Easily expandable and add new features.	• Helpdesk system & first layer support assumed to use existing/owned by TI PI PG (Technology Information Pupuk Indonesia Petrokimia Gresik). • The process of data migration & digitization from existing hardcopy documents is not included in the project scope.
Platform / Technology	
• Responsive web based (Bootstrap v123). • Mobile view based on web. • Web service written use C# .Net / PHP Laravel / Codeigniter. • Database: SQL Server / PostgreSQL	• N/A
Hardware	
• Server infrastructure during the first year of implementation.	• PC for operation, the assumption is already in the work unit. • Scanner, Camera, Smartphone personnel.

4.4 Business Options Context

The following are some of the options considered for the Master Engineering Document Digitization system solution that has been explored by the analyst team:

Table 3. Business Options Context

Type Provider	Options	Comments
Existing solutions/systems (products)	x	Not yet/ There has not been found a suitable system in the market.
In House Development	Developer & Infrastructure: TI PI PG	Development has been allocated for other strategic projects. This option is not taken.
External Resouce	Developer: External	This application is new so it does not require transfer of previous web technologies. This option can be taken.

4.5 Digitizing Master Engineering Documents Application Work flow

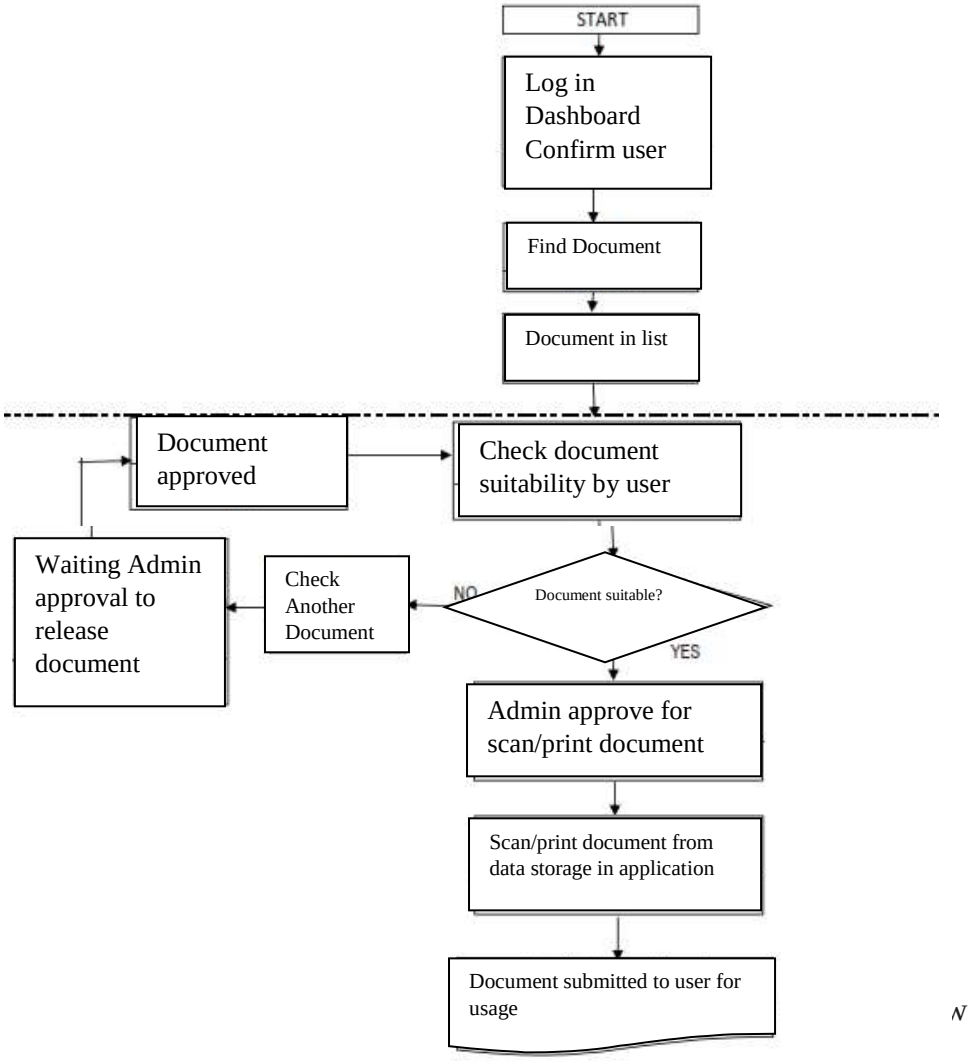

Figure 5.

The following is the workflow of the "digitizing master engineering documents" application:

1. User log in to application with verified username and password.
2. Find document in menu "search document".
3. Documents show in bucket list.
4. User has to check documents suitability.
5. If "yes", user wait for admin approval for scanning/printing documents.
6. If "No", user can check other documents that suitable.
7. Documents approved by admin will be submitted to user (by email, whatsapp, or printing documents manuall).

V. Conclusion

To digitize a document is different than preserving it, the goal of preservation being to provide access to an original item. Digitization complements preservation by protecting the original and providing far superior access. The system used in government is the Electronic-Based Government System, which is essentially the same in relation to electronic correspondence, registration, formulation of results, issuance of certificates [8]. Examples of its application are the process of issuing Intellectual Property Rights certificates at the Ministry of Law and Human Rights and the process of issuing Islamic Boarding School Operational Permits at the Ministry of Religion. Applicants do not need to come to the office to bring files, but simply open the ministry's website, then enter the application provided to register. The entire process is carried out digitally and online, until the application is granted/rejected to the issuance of a certificate which is also done digitally and online. The application of the Electronic-Based Government System is based on Presidential Regulation Number 95 of 2018 concerning the Electronic-Based Government System. The Electronic-Based Government System is aimed at realizing clean, effective, transparent and accountable governance as well as quality and reliable public services. The governance and management of the electronic-based government system nationally is also needed to improve the integration and efficiency of the electronic-based government system. Efforts to encourage the implementation of the Electronic-Based Government System have been carried out by the government by issuing sectoral laws and regulations that mandate the need for the implementation of an information system or an Electronic-Based Government System. So far, ministries, institutions, and local governments have implemented the Electronic-Based Government System individually according to their capacities, and achieved the level of progress of the Electronic-Based Government System which varies widely nationally. Synergy in the application of the Electronic-Based Government System is targeted to be achieved in the 2018-2025 period in line with the Grand Design of Bureaucratic Reform 2010 - 2025. A number of government agencies, companies and educational institutions have started the process. The initial stage is through the transition of digital correspondence activities. Letters are created through office-suite applications to be easily accessed by all electronic devices, then sent via e-mail service, and also received electrically. Recent developments, along with the COVID-19 pandemic, it turns out that the problem of digitizing signatures and stamps has been resolved through the barcoding process, namely by scanning the QR Code barcode, using an asymmetric cryptography system with public key infrastructure. Thus, the entire process is completely done digitally, with digital signatures and stamps as well. Among other things, this has been carried out in a number of Ministries. This activity is recognized according to Government Regulation Number 71 of 2019 concerning the Implementation of Electronic Systems and Transactions, and specifically regulated in the Regulation of the Minister of Communication and Information Technology Number 11 of 2018 concerning the Implementation of Electronic Certification.

According to research from Turnadi, the other advantages are:

a. The archive retrieval process becomes faster and more efficient.
b. There is an indexing system that is flexible and easy to modify based on the procedures that have been developed.
c. Save time and cost.
d. Effective search based on keywords or other information.
e. Minimizing the possibility of losing files, of course with the procedures and security tools that have been applied previously, or data backup procedures that we can apply.

f. Saving physical storage space, as an overview with the ability of a CD-RW with a capacity of 700 MB, capable of storing documents in text form of approximately 7,000 sheets (1 sheet is equivalent to 100 kb in PDF format), or 700 photos in JPEG format with 1 Mb per photo.
g. Protection from document damage that usually occurs in physical archives such as color fading due to time as well as damaged or torn paper due to careless handling of documents. By storing documents in soft copy, the risk of damage to physical archives will be easily avoided.
h. More layered security, by carrying out procedures in the management of User rights, the security process will be very easy to control and prevent people who do not have access to retrieve information from the archives that we store in digital media.
i. The recovery process is easy and fast, by backing up data into compatible storage media, the recovery process on this media will be very easy to do, compared to doing recovery on burned or torn paper, the recovery process will be very difficult to do.

Information technology is currently growing very rapidly affecting various fields of life and profession. This causes changes in systems and ways of working in agencies or companies. One form of information technology development is archives in this modern era. The existing technology is a computerized archival technology. Archives are a source of information for an agency or organization. Archives also have an important role for a government agency, private or organization, because archives record traces of their daily operational activities. The resulting archive is often a conventional archive. One of the conventional archives is the result of civil registration documents, for example birth certificates. A birth certificate is valid evidence of a person's birth to obtain or obtain certainty of a person's legal position.

In this modern era, archives need an update in terms of management by utilizing the development of information technology. One of these updates is the digitization of archives. Archive digitization is changing conventional archive forms into electronic or digital forms. Archive digitization is carried out as an effort to save information for the future. The digitization activities have been carried out by organizations/institutions. The reason organizations/institutions/institutions carry out digitalization activities is to save birth certificate archives by physically backing up archives and their information content from the threat of damage and loss, thereby making archives more secure and protected, in addition to speeding up archive retrieval so that they can take advantage of employee working time becomes more effective.

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