

MASTER OF INFORMATION AND COMMUNICATION STUDIES
Capstone Project



**UNIVERSITY OF THE PHILIPPINES
OPEN UNIVERSITY**

MASTER OF INFORMATION AND COMMUNICATION STUDIES

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ELECTRONIC DOCUMENT MANAGEMENT AND TRACKING SYSTEM

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30 May 2022

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ELECTRONIC DOCUMENT MANAGEMENT AND TRACKING SYSTEM

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VIRGILIO M. JACA JR. 05/30/2022

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Dedication

My Family:

Ma. Cristina Villar Jaca
Jae Gabrielle Villar Jaca
Alonzo Timoteo Villar Jaca

Parents:

Susan Bithao Mendoza
Virgilio Avila Jaca.

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Abstract

The PhilHealth Regional Office of National Capital Region (PRO NCR) is an office under the Philippine Health Insurance Corporation (PHIC) that has created and manages the different types of documents internally that disseminates and routed to various offices. Documents such as Advisory, Corporate Office Order, and other pertinent documents are the most common to create and process. Over the year, most of the problems gathered through interviews and personal experience are missing documents, ineffective dissemination, poor tracking, retrieving, and printing documents.

The Electronic Document Management and Tracking System (EDMTS) can manage and transmit various documents. It also centralizes storing information and electronic documents through a web application to quickly retrieve, share, disseminate, and monitor documents' status.

The web-based system comprises different modules such as user management, location library management, document type, action management, and document management, which can create new documents and route and publish the electronic document.

EDTMS was developed using PHP Laravel framework for the frontend, MySQL to store information, and Apache server as a web application server. As a result, the corporation improved its performance and increased its productivity in managing the documents.

Chapter I

INTRODUCTION

There are two types of documents being routed and sent through email, first is the hard copy documents for signature and softcopy documents for dissemination. Unfortunately, some hard copy documents might get lost due to mishandling or misfiled. Different platforms are being used for logging the received and released documents, such as manual logbooks, Google Sheets, and excel files that make the personnel spend too much time searching. Another common issue with hard copy documents is mass printing to reproduce and disseminate information, which increases paper waste volume.

On electronic documents, a problem only arises when a large file is sent to the email, which causes free space of email storage on the server to be quickly consumed and makes the personnel regularly archive and or save a file copy before being deleted. EDTMS offers the solution to address various issues and problems, such as quickly sharing the documents using a single platform that personnel can commonly visit. Reduce the printing of hard copy documents due to electronic signature. It provides a paper trail that makes it easy and quickly verifies the exact location and the status of the papers or documents.

The main goal of this project is to digitize the process of managing and tracking the documents. Digitalization will improve collaboration among users by immediately informing the existence of documents that need comments, approval, and dissemination. It will also lessen paper documents with digital documents, reducing costs and saving money on buying office supplies. Also, the routing of physical copies will be lessened.

Another thing to improve is tracking and retrieving documents by providing a unique document number or description to view the document instead of relying on a manual logbook. Sometimes, the user might forget to log the details, which causes copies to be hard to track. Having this system means convenient and quick retrieval of the documents, which is one of the key objectives. It also needs to reduce the Turn Around Time on every process, from document creation to routing and approving, which increases productivity.

Despite the small impact on the environment, the implementation of EDTMS can save hundreds or thousands of sheets of paper per month. Adopting a paperless approach is not fully implemented in this system, but this takes a little step toward an environmentally-friendly business model. Furthermore, reducing physical paper will also reduce the leased storage in our warehouse, particularly in the office, which will lower the cost of leasing space and the procurement of physical paper.

The risk of missing the documents and accidentally deleting the electronic copy of the document from the PC is likely to happen. Still, this system will have a better backup and recovery of electronic records since the repository is centralized, making it easy to manage. Another significance of this system is the improvement of the workflow. The movement of documents between different departments or units is quickly, right after the saving, which immediately reflects as a received document to other users aside from the email notification received that results in a speedy process.

This project will consist of different modules and access levels for different types of users. In general, all the users can register to have an account in this system then the user administrator can grant or revoke the registration. By default, all the users have viewing access only and can only view publicly available published documents unless modified by the administrator according to its task. There are five

types of users: maintainer, administrator, document creator and publisher, router, and viewer only. The maintainer is responsible for adding and updating libraries of roles, permissions, document types, document action, and office locations. The administrator is responsible for approval and revocation of users with pending registration on the system; the administrator is also responsible for approval and revocation of the user's relocation to the other office once transferred to other departments or regional offices. The document creator and publisher have the capability of creating a new document for approval or dissemination. And the router is responsible for creating a new tracking number, routing by receiving and releasing, and tagging as terminal. Lastly is the unregistered user, whose only capability is to view the published documents shared with the public. For the users to do the activities, the following modules have been created:

- User Login and Registration Module
- User Management Module
 - User, Role, and Permission Module
- Office Location Management Module
- Document Type and Action Management Module
- Routing Module
- Document and Publish Management Module.

The project has undergone a series of meetings with the users and other personnel that clarified the process and finalized the ideas. All the personal computers of the document creator have an Acrobat reader installed to apply the electronic signature. It also has a scanner since some of them had opted to submit the physical document in electronic copy. Optionally all workstations can have a barcode reader for the ease of encoding the unique document number for receiving, releasing, or tracking the hard copy document.

Chapter II

REVIEW OF EXISTING ALTERNATIVES

The old manual management methods and tracking documents are tedious; some manual processes are still practiced. Starting with creating documents such as Circulars, Office Orders, Corporate Memorandum, and Request for Overtime, usually are printed as draft copies for comment in a particular office before being re-route again for final approval. This kind of collaboration can take much time, which results in a decrease in productivity. Some documents are sent through email to cope with the problem, but another problem may arise as the free space of email consumes fast and sometimes makes this a repository. And this makes users regularly perform the archiving and downloading of the documents before deletion.

Admin section personnel's common task is the dissemination of information. Sometimes, they need to print a document such as approved overtime and standard operating procedures to have a physical copy distributed to different sections since not all users have an email address. It causes increased bond paper usage, leading to increased procurement and allotment of additional storage for physical copy safety. Scratch or used paper is being re-used to cope with this problem, where you can print on the paper's other side.

One of the users' most significant problems is finding the documents, both electronic and hard copies. The worst case of physical documents routed are missing, and no one accepts the responsibility for who last received the documents. The user should manually sign the logbook before the papers are released or received to know where to follow up and pull out the copy to cope with this problem. But this approach is very tedious since the user needs to write their name, location, date received or released, and signature. To partially centralize the logging of documents, Google

Sheet is allowed but still has the problem since not all the personnel are permitted to use the internet.

When it comes to protecting the data, backup is the usual thing after creating a document, either from a PC or flash drive. But this solution is often neglected as their PC is always in a good state and did not practice the regular backup. Its storage to backup makes the documents scattered from different machines, unsecured, and leads to uneasy access. Some users have provided access to a file server to back up their files to cope with this issue, but not all the users have access and still do not practice it.

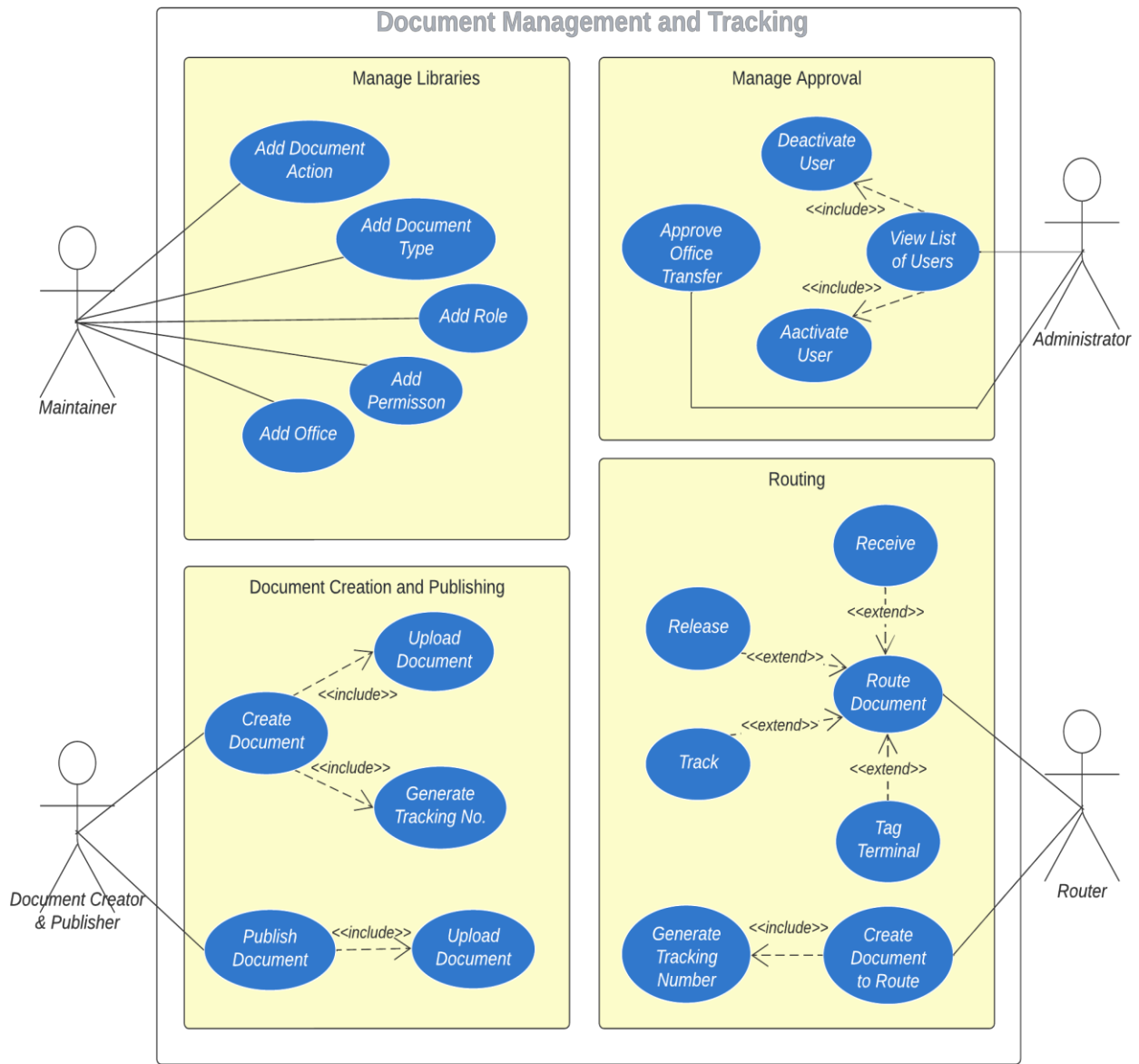
Despite having a resource such as computers, scanners, barcode readers, a server for email, a file server, and the internet, the problems mentioned above still exist. To maximize the use of existing resources and remove the old ways or manual approach to managing and tracking the documents, EMDTS shall use. The system is more advanced in collaboration, centralization, securing, tracking, and disseminating the documents. Collaboration with the document needs not to forward to email or print a draft copy for those who have no email before commenting. Instead, upon submission of a document through EMDTS, just selecting the users will instantly access the file and could reply to a comment. Centralizing and securing the electronic copy of documents can now automatically have performed since every document created will be directly saved in a single repository from a server that can automatically backup and secure. Lastly, the dissemination can also happen instantly upon the document's approval and publishing of a soft copy through the EDMTS. And it is automatically accessible in a particular module in the system depending on the access restriction.

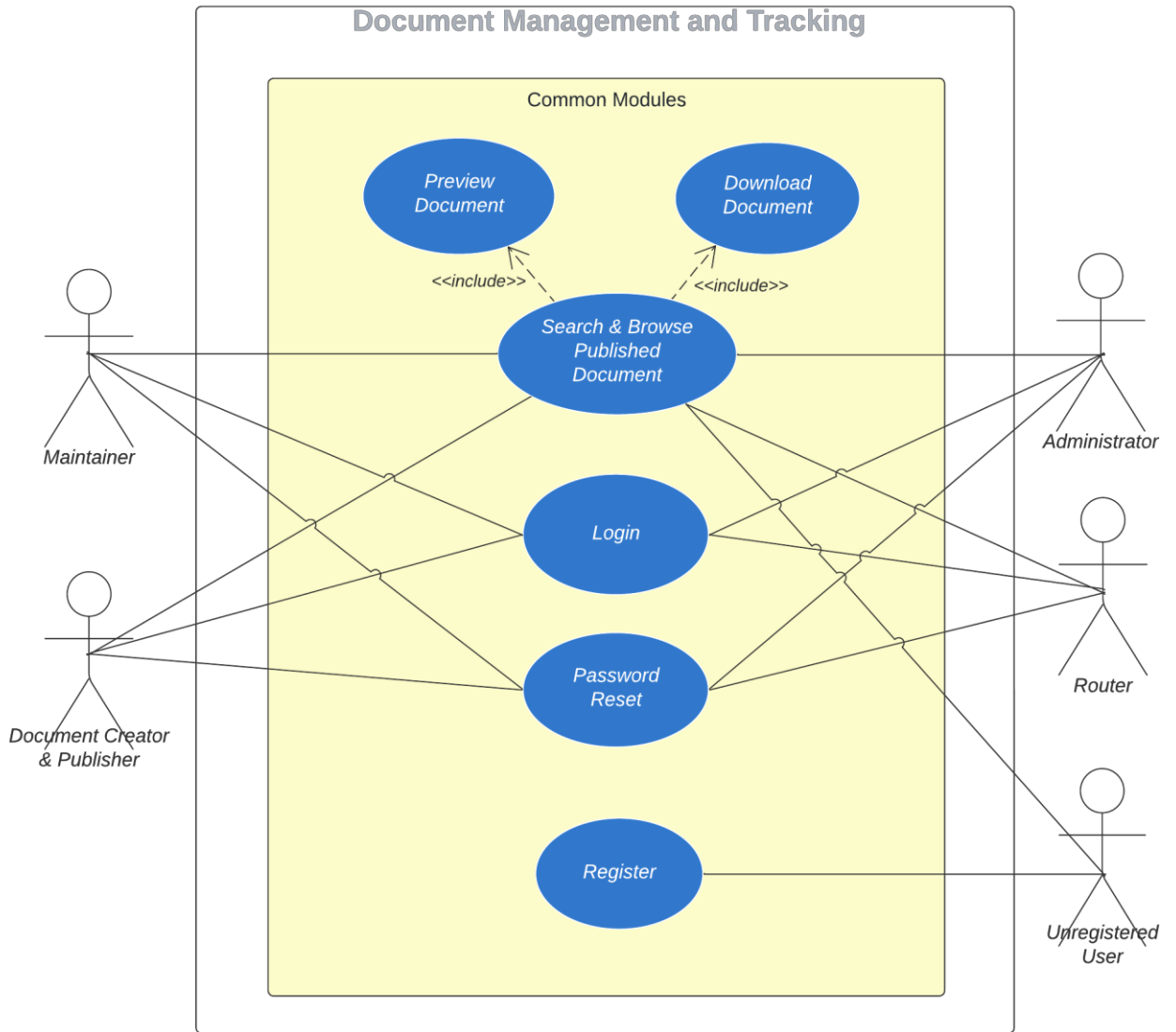
Chapter III

PROJECT DETAILS

Overview

Use Case Diagram





Theoretical Framework

Information System theory

The information system theory used in this project was Technology Acceptance Model (TAM). TAM explains and predicts the use of technology and behavioral intention by examining the core constructs: perceived usefulness and ease of use. Perceived ease of use refers to how technology use is free from effort (Davis, 1989) [1], while perceived performance refers to the degree to which the user thinks that technology improves performance (Bandura, 1982) [1].

Using TAM, the EDMTS was able to analyze the usefulness and the ease of use of the system where five users provided the survey and responded to the following scenario with a seven-point Likert scale where 1 as highly likable up to 7 as highly unlikeable and below are questionnaire and result:

Perceived use (PU):

Email	Full Name	Using EDMTS in my job would enable me to accomplish tasks more quickly	Using EDMTS would improve my job performance	Using EDMTS in my job would increase my productivity	Using EDMTS would enhance my effectiveness on the job	Using EDMTS would make it easier to do my job	I would find EDMTS useful in my job
jacamc@philhealth.gov.ph	Ma Cristina V. Jaca	1	2	1	1	2	1
saldevarc@philhealth.gov.ph	Cristiefel R. Saldevar	1	1	1	1	1	1
galanidat@philhealth.gov.ph	Tiffany Galanida	1	2	2	2	2	2
tapawani@philhealth.gov.ph	Igie Tapawan	1	1	1	1	1	1
joanaddun012@gmail.com	Joan C. Addun	1	1	1	1	1	1

Perceived ease of use (PEU):

Email	Full Name	Learning to operate EDMTS would be easy for me	I would find it easy to get EDMTS to do what I want it to do	My interaction with EDMTS would be clear and understandable	I would find EDMTS to be flexible to interact with	It would be easy for me to become skillful at using EDMTS	I would find EDMTS easy to use
jacamc@philhealth.gov.ph	Ma Cristina V. Jaca	1	2	1	1	1	1
saldevarc@philhealth.gov.ph	Cristiefel R. Saldevar	1	1	1	1	1	1
galanidat@philhealth.gov.ph	Tiffany Galanida	1	1	1	1	1	1
tapawani@philhealth.gov.ph	Igie Tapawan	1	1	1	1	1	1
joanaddun012@gmail.com	Joan C. Addun	1	1	1	1	1	1

To assess the above survey, Cronbach's alpha was used to measure the consistency [2] of the items on how closely related a set of items as a group is when it comes to PU and PEU of the system. To calculate all the values, Datatab online statistics calculator [3] was used with the corresponding criteria [4] and result:

Interpretation Criteria:

Cronbachs Alpha	Interpretation
> 0,9	Excellent
> 0,8	Good
> 0,7	Acceptable
> 0,6	Questionable
> 0,5	Poor
< 0,5	Unacceptable

Perceived use (PU) result:

Cronbach's Alpha

Reliability Statistics

Copy Word  Copy Excel  

Cronbach's Alpha	Number of Items
0.9	6

Item-Total Statistics

Copy Word  Copy Excel  

	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
1. Using EDMTS in my job would enable me to accomplish tasks more quickly.	NaN	0.94
2. Using EDMTS would improve my job performance.	0.79	0.87
3. Using EDMTS in my job would increase my productivity.	0.88	0.86
4. Using EDMTS would enhance my effectiveness on the job.	0.88	0.86
5. Using EDMTS would make it easier to do my job.	0.79	0.87
6. I would find EDMTS useful in my job.	0.88	0.86

As you observed, Perceived of Use got 0.9 which is equivalent to good, and Perceived Ease of Use is concluded to be good due to the mostly selected scale of 1 from any six questionnaires. As a result, EDMTS is a useful and easy-to-use application.

Systems Design Principles

During the development, some design principles [5] were followed and observed to set guidelines that produced a good design for the system development, hardware, system, and test design.

- a. **Use models to design systems** - Use the database model in EDMTS to reduce redundant data, identify the existing table, create a clearer scope, and provide better documentation.
- b. **Prioritize** - Identifying all the main components of the system and being able to build first.
- c. **Design the interface** - Design every module in EDMTS, from the main form to the library form, and co-relate each other to define the boundaries.
- d. **Maintain an update model of the system** - Maintaining an update is one of the important task; it gives an accurate, current process in place.
- e. **List functional requirements in the use case** - As part of software requirements specifications, it provides detailed instruction and description of the function that can perform in EDMTS to determine the capabilities and constraints.
- f. **Develop iteratively and test immediately** - It helps detect errors or bugs that might occur due to the previous adjustment of the system and ensure that there will be no repeated problem.

- g. Create libraries of reusable objects** - This applies to the libraries of EDMTS, which has a shared library for location, document type, etc., for the use of other modules. In addition, the development of EDMTS used the Laravel framework for practical reusable of existing functions.
- h. Use open standards** - It ensures the quality, safety, and efficiency of the product.
- i. Rapid prototyping** - Develop a prototype for every module so the user can immediately comment on the interface and functionality of the system.
- j. Create design margins** - This applies when installing the logical server and all the required specifications had to double for the system to perform at its best in terms of bandwidth, hard disk space, and memory allocation.

Technologies Used

The EDMTS uses the Internet Protocol to communicate to other network computers from the application layer perspective. Since it has multiple processes in a server, it uses port 9000 to define a specific process. The server where the EDMTS has been installed runs in Windows Server. Also, in this server, the auto-backup is configured to maximize the features of EDMTS, where it automatically backups all the uploaded documents.

EDMTS uses MySQL database to store data, Apache to run the web service, and PHP to develop a web application on the server-side, and all these are open-source and cross-platform. XAMPP is the software used to install all those applications mentioned in a single package. In addition to the web development application, EDMTS has been built using the Laravel framework, CSS, HTML, and JavaScript.

Finally, electronic devices such as barcode reader that scan the tracking number and document scanner to make an electronic copy of document can be used to upload a soft copy document if necessary.

System Design

a. System Features

Some of the significant known features are as follows:

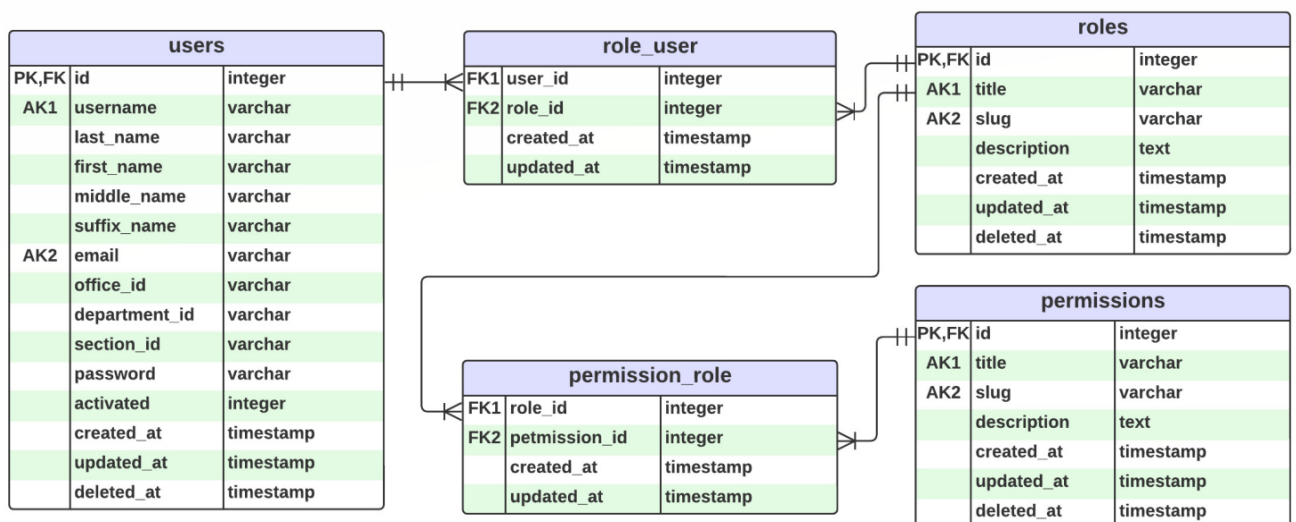
- 1. Searching of Published Document** - The document can easily browse and download a copy by searching using criteria such as; tracking/barcode number, document type, document name, or date published. All the users can access the documents depending on the restriction set by the publisher. In addition, all previously published documents are readily available on the home page, without even searching it.
- 2. Ease of tracking, retrieving & receiving of the routed document** - Having a tracking number attached to a hard copy document can easily track and log the incoming and outgoing documents by scanning the number using a barcode reader or manually entering the fields readily available on the home page.
- 3. Turnaround-time of routed document** - Counting the turnaround time from the date received by your office to the date received by the other office helps measure the efficiency and productivity of an office or a specific user.
- 4. Centralized and auto-backup** - These features are automatically set and performed through the server. All documents attached, published,

or submitted will be stored in a single repository, while this repository will be regularly performing a backup from the logical server.

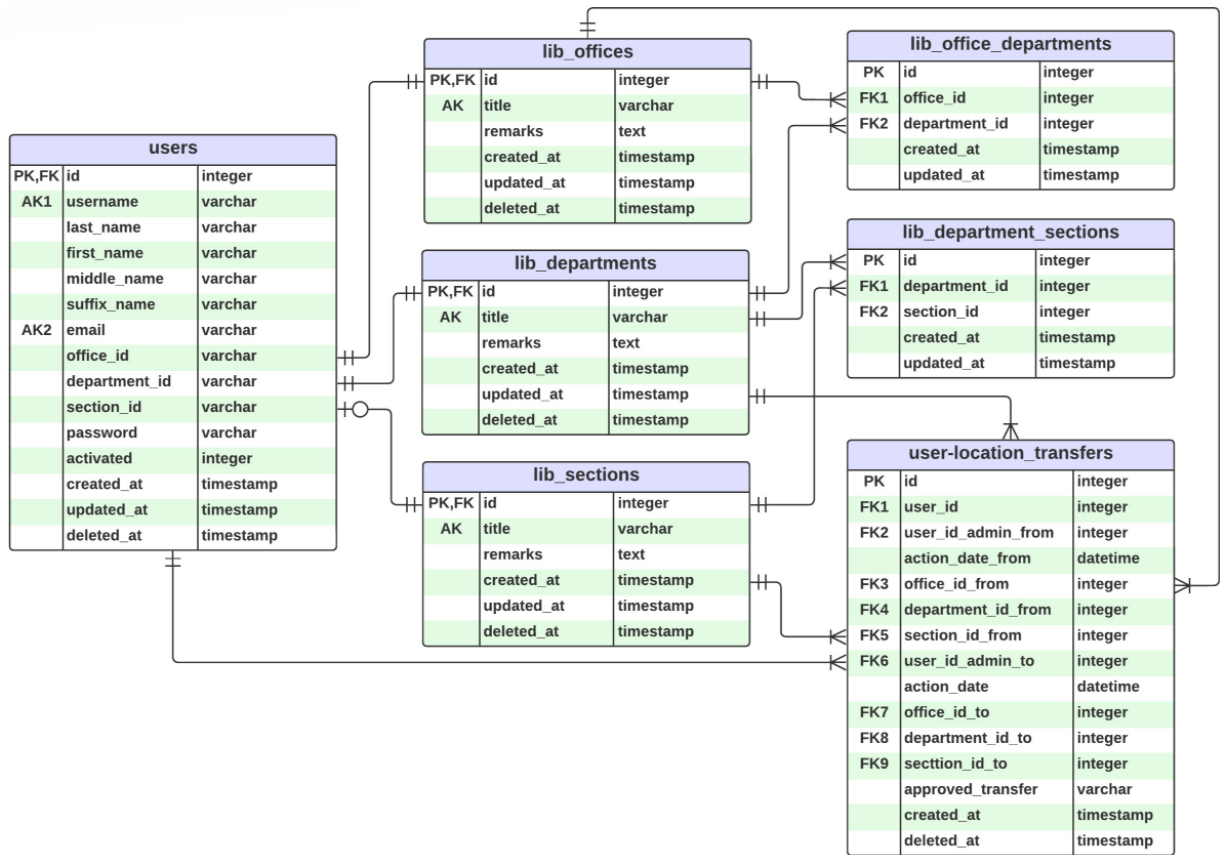
5. **Routed Document Trail** - The system will automatically log the location where it was released or received and the date and time when it was released or received by the office. This feature can determine where is the last location of the document.
6. **Published Document restriction** - The publisher can set the restriction in selecting a specific department or regional office. And in this case, the user can only access the published document based on its office location or the concerned office only.
7. **Access restriction** - This feature can make the administrator flexible in setting permission for every action performed by the user. It allows limiting a specific user's access to a module that doesn't need based on the current position. For example, a user can only view the document but cannot approve it or view it but cannot receive or release it.

b. Database Design

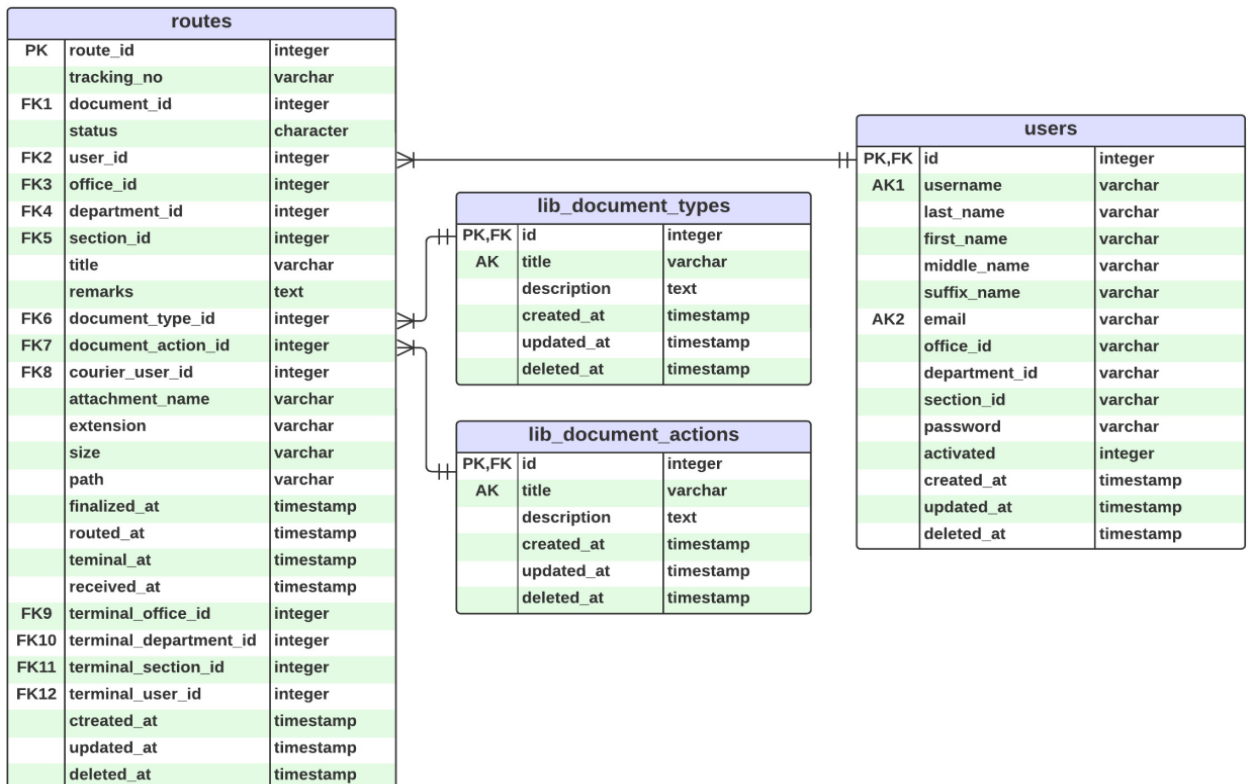
User Roles and Permissions



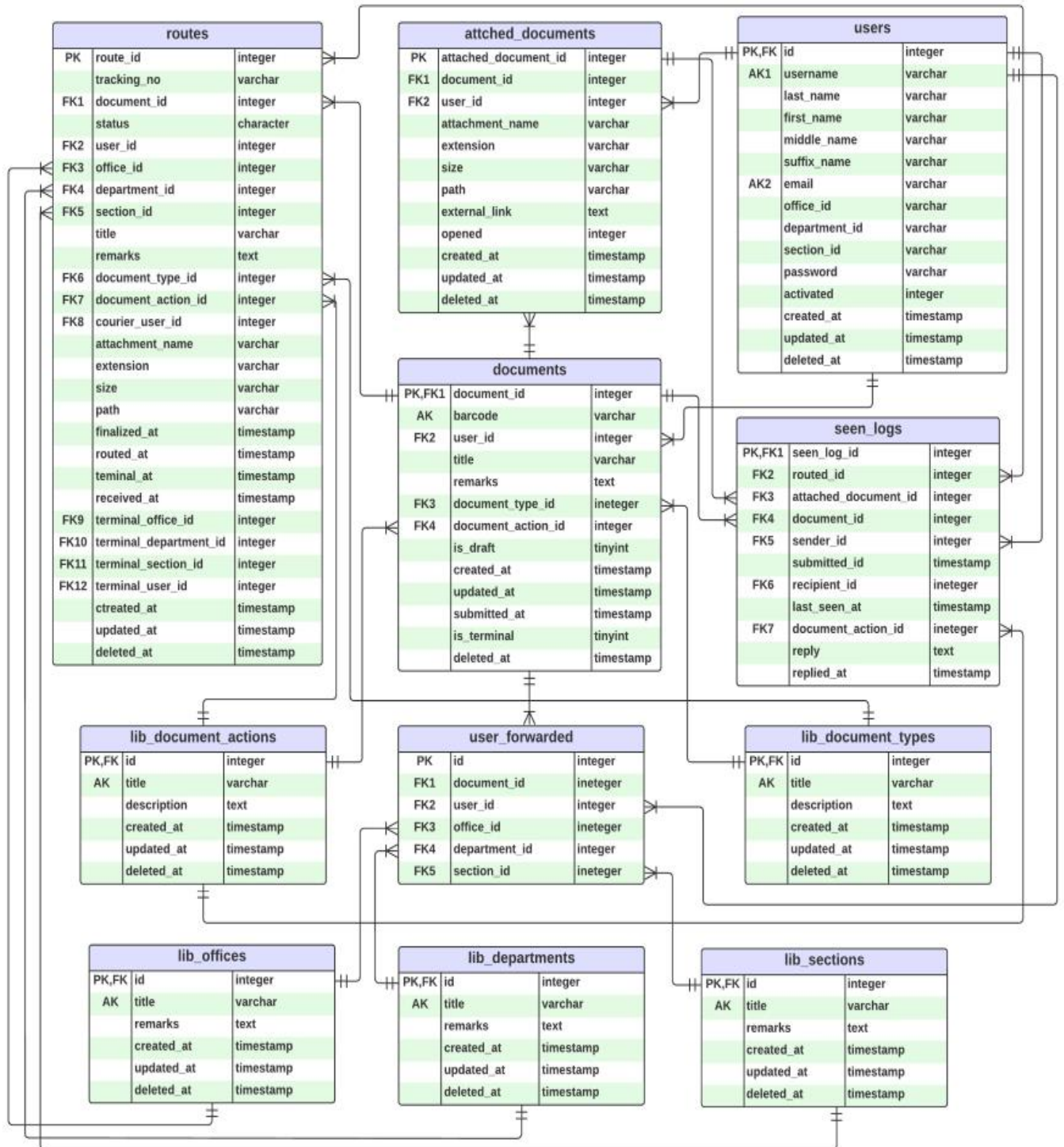
Office Locations



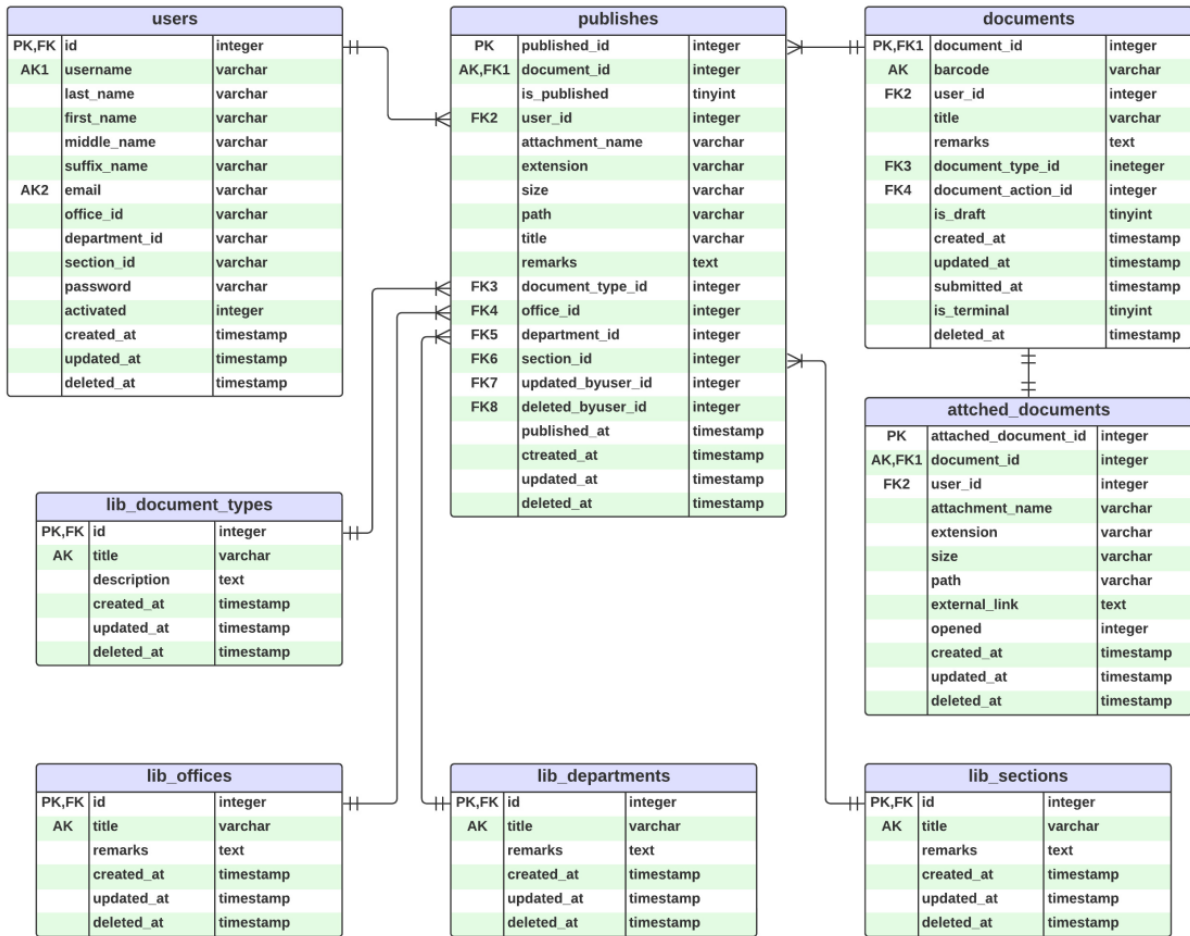
Document Routing



Document Create



Publish Document



c. Application Screenshots

Home Page (General Users)

The screenshot shows the user interface of the Electronic Document Tracking System (DTS). The page includes a dark sidebar with navigation options: Home and Published Document. The main content area displays a notification titled 'UPDATE Additional Offices' with the message: 'South, North, and Central PhilHealth Regional Office of NCR has been added to the library.' Below this, there is a section for 'CPO' (Current Published Objects) showing a document titled 'OT of Admin' with a size of 537.45 KB and a date published of May 27, 2022. At the bottom, there is a search bar labeled 'ADVANCE PUBLISHED DOCUMENT SEARCH'. The footer contains the text: '2022 © Electronic Document Tracking System, version 1.0', 'May 29, 2022 - 15:59:37', and 'Philippine Health Insurance Corporation'.

Advanced Search for Published Documents

The screenshot shows the 'Electronic Document Tracking System (DTS)' interface. On the left is a dark sidebar with a home icon and 'Published Document' link. The main header includes a 'LOGIN' button and a settings icon. The 'ADVANCED SEARCH' section contains a 'Document Criteria' form with the following fields: 'Document Type' (dropdown), 'Document name' (text), 'Attachment name' (text), 'Published Date (Start)' (calendar icon, format mm/dd/yyyy), 'Published Date (End)' (calendar icon, format mm/dd/yyyy), and 'Remarks' (text). A blue 'Search' button is positioned below the date fields.

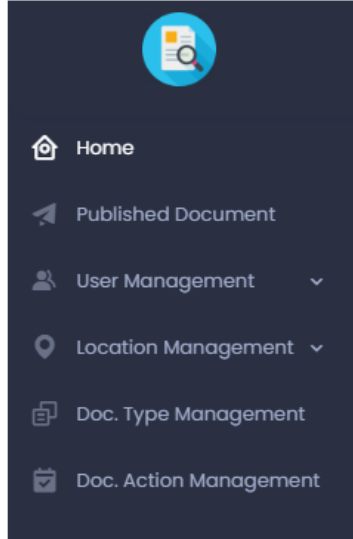
User Login and Registration

The 'User Login' page features a header with the system name and a user illustration. It includes a logo, a text input for 'ID Number or Email Address' (containing '20556408'), a password input (masked with dots), a 'Remember me' checkbox, and a blue 'Log In' button. A 'Forgot your password?' link is located below the button. At the bottom, there is a link to 'Register now' and a copyright notice: '© 2020 Philippine Health Insurance Corporation ❤️ PRO NCR-South'.

The 'User Registration' page includes a header with the system name and a user illustration. It features a logo and a series of form fields: 'ID Number (username)*' (text, '20556405'), 'Email*' (text), 'Last Name*' (text), 'First Name*' (text), 'Middle Name*' (text), 'Suffix Name' (text, 'E.g. Jr, Sr.'), 'Region*' (dropdown), 'Dept./Unit/Branch*' (dropdown), 'LHIO/Section' (dropdown), 'Password*' (text), and 'Confirm Password*' (text). A blue 'Register' button is at the bottom.

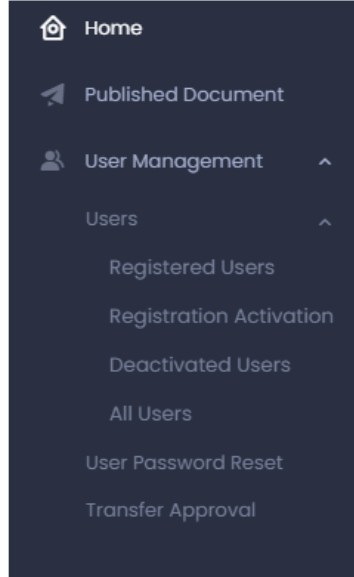
Types of Users with Respective Modules

Maintainer



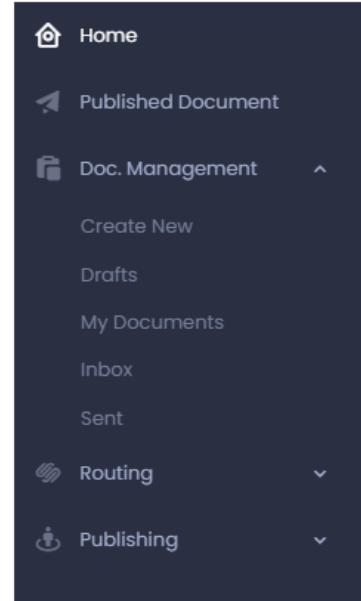
- Home
- Published Document
- User Management
- Location Management
- Doc. Type Management
- Doc. Action Management

Administrator



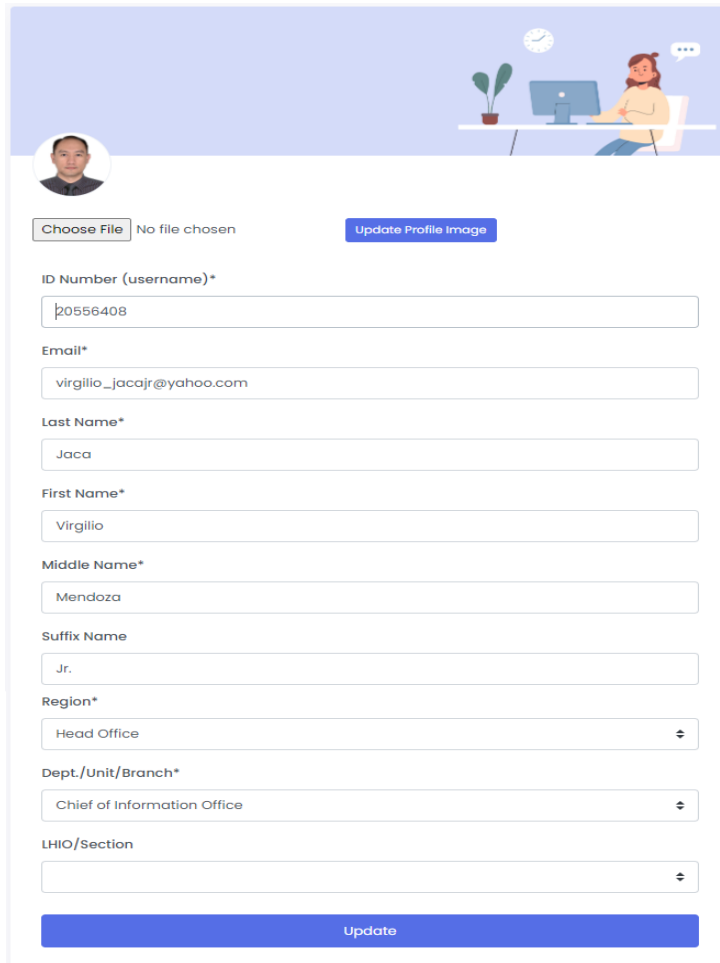
- Home
- Published Document
- User Management
 - Users
 - Registered Users
 - Registration Activation
 - Deactivated Users
 - All Users
 - User Password Reset
 - Transfer Approval

Document Creator, Router & Publisher



- Home
- Published Document
- Doc. Management
 - Create New
 - Drafts
 - My Documents
 - Inbox
 - Sent
- Routing
- Publishing

User profile



Choose File No file chosen [Update Profile Image](#)

ID Number (username)*

Email*

Last Name*

First Name*

Middle Name*

Suffix Name

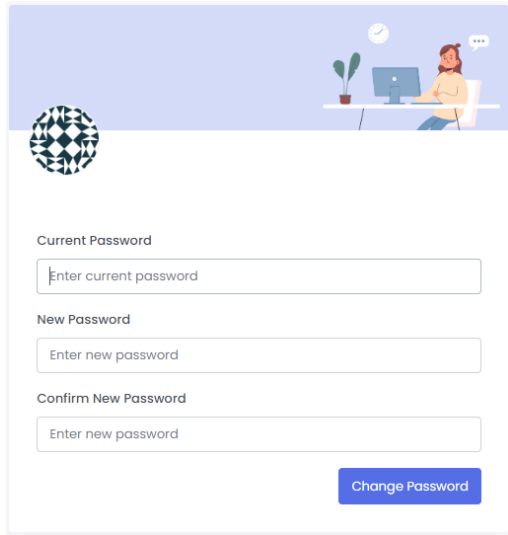
Region*

Dept./Unit/Branch*

LHIO/Section

[Update](#)

User Change Password



The form is titled "User Change Password" and features a decorative header with a logo and an illustration of a person at a computer. It contains three input fields: "Current Password", "New Password", and "Confirm New Password", each with a placeholder text "Enter current password" or "Enter new password". A blue "Change Password" button is located at the bottom right.

Roles (User Management)

Home / List of Roles

[Add New](#)

#	Title	Description	Slug Name	Status	Action
1	Router Only	Can only released and received routed document.	router_only	Active	View Edit Delete
2	Route Viewer	Can only view information of routed document.	route_viewer	Active	View Edit Delete
3	Administrator	Can view, update, activate, disable and enable user. Can reset password of user and approve transfer of location.	administrator	Active	View Edit Delete
4	Document Creator, Router and Publisher	Create new document. With full access on routing and publishing of document.	document_router_publisher	Active	View Edit Delete
5	Document Creator	Create new documents and send to other users.	document_creator	Active	View Edit Delete
6	Maintainer	Manages office location, document type and document action, roles and permissions.	maintainer	Active	View Edit Delete

Permissions (User Management)

Home / List of Permissions

[Add New \(Please notify the developer\)](#)

Show entries Search:

#	Title	Description	Slug Name	Status
1	Add new department	department:	department_store	Active
2	Disable department	department:	department_disable	Active
3	Enable department	department:	department_enable	Active
4	Update department	department:	department_update	Active
5	View list of departments	department:	department_view	Active
6	Search Document	document_management:	search_document	Active
7	Create Document	document_management: Create new, Delete draft document, view list of drafts, re-generate barcode	create_document	Active
8	Delete Document	document_management: disable only, EXCEPT DRAFT DOC	disable_document	Inactive
9	View or Download Attachment	document_management: View attached and download document	view_download_attachment	Inactive
10	Add document action	documentaction:	documentaction_store	Active

Showing 1 to 10 of 61 entries Previous **1** 2 3 4 5 6 7 Next

Registered User (User Management)

Home / List of Registered Users

Copy Excel PDF Column visibility Search:

#	Role	ID Number	Name	Email	Registration Status	User Status	Action
	Route Viewer	10000010	Rojas, Susan Mendoza	susan@gmail.comxx	Activated	Enabled	
	Document Creator, Router and Publisher	30738319	Addun, Joan C	addunj@philhealth.gov.ph	Activated	Enabled	
	Router Only	10000009	Protacio, Alvin Belmonte	protacio@gmail.comxx	Activated	Enabled	
	Document Publisher	10000011	Santos, Reynaldo Villanueva	rey@gmail.comxx	Activated	Enabled	

Registration Activation (User Management)

Home / List of New Users

Copy Excel PDF Column visibility Search:

#	Role	ID Number	Name	Email	Registration Status	User Status	Action
		20000000	Jaca, vir mendoza	vir@yahoo.com	For activation	Enabled	
		10101010	Vir2, Jac2 M2	2virgilio_jacajr@yahoo.com	For activation	Enabled	

Showing 1 to 2 of 2 entries

Previous 1 Next

Deactivated User (User Management)

Home / List of Deactivated Users

Copy Excel PDF Column visibility Search:

#	Role	ID Number	Name	Email	Registration Status	User Status	Action
	Document Creator, Router and Publisher	30738319	Addun, Joan C	addunj@philhealth.gov.ph	Activated	Disabled	

Showing 1 to 1 of 1 entries

Previous 1 Next

User Password Reset (User Management)

Home / List of User

Copy Excel PDF Column visibility Search:

#	Role	ID Number	Name	Email	Registration Status	User Status	Action
1	Route Viewer	10000010	Rojas, Susan Mendoza	susan@gmail.comxx	Activated	Enabled	
2	Document Creator, Router and Publisher	30738319	Addun, Joan C	addunj@philhealth.gov.ph	Activated	Disabled	
3	Router Only	10000009	Protacio, Alvin Belmonte	protacio@gmail.comxx	Activated	Enabled	
4	Document Publisher	10000011	Santos, Reynaldo Villanueva	rey@gmail.comxx	Activated	Enabled	
5	Route Creator	10000008	Gavino, Paning Jimenez	gav@gmail.comxx	Activated	Enabled	

Location Transfer Approval (User Management)

Home / List of Transferees for Final Approval

Copy Excel PDF Column visibility Search:

#	Role	ID Number	Name	Current Location	Transfer To	Action
	Maintainer	20556408	Virgilio Mendoza Jaca Jr.	Head Office, Chief of Information Office,	Head Office, Information Security Department, IT Helpdesk	

Region/Office Update (Location Management)

OFFICES Home / List of Offices

Add New

Show 10 entries Search:

#	Title	Remarks	Status	Action
1	Head Office	1:	Active	
2	PRO NCR	2:	Active	

Showing 1 to 2 of 2 entries Previous 1 Next

Department/Unit/Branch Update (Location Management)

DEPARTMENT Home / List of Departments

Add New

Show 10 entries Search:

#	Title	Remarks	Status	Action
1	Chief of Information Office	HEADOFFICE:	Active	
2	Information Security Department	HEADOFFICE:	Active	
3	Information Technology Management Department	HEADOFFICE:	Active	

Local Health Insurance Office (LHIO)/Section

SECTIONS Home / List of Sections

Add New

Show 10 entries Search:

#	Title	Remarks	Status	Action
1	IT Helpdesk	INFOSEC:	Active	
2	Office of the Manager (Infosec)	INFOSEC:	Active	
3	ITRMD	ITMD:	Active	

Document Type Management

DOCUMENT TYPES Home / List of Document Types

Add New

Show 10 entries Search:

#	Title	Description	Status	Action
1	Advisory		Active	
2	Corporate Office Order (CPO)		Active	
3	Overtime		Active	

Showing 1 to 3 of 3 entries Previous 1 Next

Document Action Management

DOCUMENT ACTIONS

Home / List of Document Actions

[Add New](#)

Show 10 entries Search:

#	Title	Description	Status	Action
1	Acknowledged		Active	Edit Lock
2	Approved		Active	Edit Lock
3	Disapproved		Active	Edit Lock

Create New Document (Document Management)

DOCUMENT

Home / Create new document

Document Information:

Document name

Document Type

For

Remarks

Forward To:

Recipients

Attachment:

Attach File [Browse](#)

Note: File allowed:
Size: Maximum of 10 MB
File Type: jpg, jpeg, png, pdf, doc, docx, xls, xlsx, ppt, pptx

Attachment Link

Note: Copy paste link of large document resides at Google Drive, File Server and Etc.

[Save as Draft](#) [Submit](#)

Inbox (Document Management)

RECEIVED DOCUMENTS

Home / List of Received Documents

Show 10 entries Search:

#	Barcode	Sender	Document Name	Document Type	For	Date and Time Submitted	Action
No data available in table							

Showing 0 to 0 of 0 entries [Previous](#) [Next](#)

Routing Management

- Home
- Published Document
- Doc. Management
- Routing**
- Routing Management
- Draft
- Finalized (Created)
- Received (Pending)
- Released
- Terminal
- Publishing

ROUTING DOCUMENT

[Add document for routing](#)

Search

Received

Released


Tag as Terminal

New Document to Route (Routing Management)

DOCUMENT ROUTING

Home / Route Management / Create document routing

Note: Crop the image inside the box using [Snipping Tool](#) or any cropping utilities and paste to any Microsoft Office apps.
Paste the image from MS Word, right click on the image and select "Wrap Text" then "Behind text". Now you can place the image on upper righth corner.
Refreshing the page will automatically renew the tracking number.



Document Information

Document name

Document Type

For

Remarks

Attachment

Attach File [Browse](#)

Note: File allowed:
Size: Maximum of 10 MB
File Type: jpeg, png, pdf, doc, docx, xls,xlsx, ppt, pptx

Courier Name

[Save as Draft](#) [Released](#)

Received Document (Routing Management)

- Home
- Published Document
- Doc. Management
- Routing
- Routing Management
- Draft
- Finalized (Created)
- Received (Pending)

RECEIVED DOCUMENTS
Home / Received Documents

Show entries Search:

#	Tracking Number	Document Name	Document Type	Remarks	Action
1	220527-160249-319	OT for BAS	Corporate Office Order (CPO)		🔍 📄 🗑️

Showing 1 to 1 of 1 entries

Previous 1 Next

Routed Document Details

Document Basic Details ✕

Status: Active

Tracking Number: 220527-160249-319
 Name: [OT for BAS](#)
 Type: [Corporate Office Order \(CPO\)](#)
 For: [For Approval](#)
 Remarks:
 Email Notification: [No](#)
 Courier Name: [Castro, Jayson Manolo Sr](#)
 Date & Time Created: 2022-05-27 16:06:41

Tag as Terminal By (Date): ()
 Terminal Office:

Attachment:

Close

Document Route Details

Route Details ✕

Status: Active

Tracking Number: 220527-160249-319
 Document Name: [OT for BAS](#)
 Document Type: [Corporate Office Order \(CPO\)](#)
 For: [For Approval](#)
 Remarks:
 Finalized By (Date): [Addun, Joan C \(2022-05-27 16:04:27\)](#)
 Originating From: [Head Office, Information Technology Management Department, ITRMD](#)
 Tag as Terminal By (Date): ()
 Terminal Office:

Status	Action	Date & Time Routed	TAT (DAY/S)	Routed By	Office
Received	For Approval	2022-05-27 16:06:41	2	Galanida, Tiffany Ramos	PRO NCR, NCR South, I.T. Unit
Released	For Approval	2022-05-27 16:04:27	0	Addun, Joan C	Head Office, Information Technology Management Department, ITRMD

Close

Office	Courier Name	Attachment	Remarks
PRO NCR, NCR South, I.T. Unit	Castro, Jayson Manolo Sr		
Head Office, Information Technology Management Department, ITRMD	Castro, Jayson Manolo Sr		

[Close](#)

Publish New Document

- Home
- Published Document
- Doc. Management
- Routing
- Publishing
- Publish
- List of Published
- List of Temporary Deleted

PUBLISH DOCUMENT
Home / Publish new document

Document Information

Document name

Document Type

Remarks

Attach File [Browse](#)

Note: File allowed:
Size: Maximum of 10 MB
File Type: jpeg, png, pdf, doc, docx, xls, xlsx, ppt, pptx

Publish To

Note: Leave these fields blank to make the document visible to all staff, regardless of the office.

Region

Dept./Unit/Branch

[Publish](#)

List of Published Documents

PUBLISHED DOCUMENTS
Home / List of Published Documents


Show entries Search:

#	Document ID	Document Name	Document Type	Attachment Name	Date and Time Published	Action
No data available in table						

Showing 0 to 0 of 0 entries [Previous](#) [Next](#)

User and System Details


About
✕



Version 1.0
Electronic Document Tracking System

Virgilio M. Jaca Jr. (PRO NCR South)
Philippine Health Insurance Corporation
© 2022

SHOW USER INFORMATION



Virgilio Mendoza Jaca Jr.
20556408 (Maintainer)
virgilio_jacajr@yahoo.com
Head Office, Chief of Information Office

May 29, 2022 - 18:07:02

Implementation

The implementation started with the requirements gathering through a series of interviews and meetings. Five stakeholders participated in this stage to discuss their requirements and understand what they needed to make the product clear and concise.

After having the specifications and determining the scope of work, the software look would follow by creating the prototype at the design stage, which the stakeholders approved. Also, in this stage, the data modal was produced and identified what database and programming language should be used, considering the programmer's skills and capability.

Since all the requirements had been set, I started installing the software needed to develop the application, including third-party applications, followed by the configuration of a logical server where the developed application and database are stored. After the database was set up, coding was followed to build the application, and it was decided to make the application per module to easily check the progress and seek approval from the stakeholders before being integrated. I started to build the libraries such as document actions, types, office locations, roles, and permissions and populated from other modules.

The testing and development stage was performed iteratively. If there were needed to be fixed or adjustments to be made, it can easily identify the effect from other modules and fix the problem the sooner. There was also final testing, where the working product had to undergo a complete cycle of testing to check if the expected output had been met.

The application's file is copied into the logical server after passing the complete cycle and deployment approval, followed by the programming or coding. After the

coding, complete cycle testing is again performed before being published since it is now in a different environment from where the system is developed. During the testing, problems encountered include blocked ports, inaccessible domains, mail server problems, etc. After solving all the system issues, user training was followed to use the system effectively and know all the features.

Lastly is the maintenance stage. In this stage, the server's operating system should be regularly updated to get new patches and stay secured. Regular backup should be regularly monitored to secure a copy of the last working OS and application file, including the attached file or published file by the user as a repository. Optimization and defragmentation of the database are also critical tasks and must be performed regularly.

Chapter IV
PROJECT ASSESSMENT
User Testing

Five personnel participated in the user testing, and these users are the actual users from their assigned respective areas. After scheduling the meeting and confirming the participants, five PC, scanners, and barcode readers were set up in the testing area. Also, the local network was configured and installed necessary third-party applications such as PDF or Adobe Acrobat Reader.

During the testing, the following procedures and testing specifications were handed to the users to be able to identify if the system and its modules were fully integrated and compliant with the desired output, find bugs and test peripheral connections if they interact correctly with the system:

1. User Registration
2. User Login
3. User Activation and Role Assignment
4. Add Role and its Permissions
5. Add Local Health Insurance Office (LHIO) /Section
6. Add Department/Unit/Branch and its LHIO/Section
7. Add Region/Office and its Department/Unit/Bra
8. Add Document Type
9. Add Document Action
10. User Password Reset
11. Update User Profile or Change Location
12. Department or Section Transfer Approval (Within the Office)
13. Region or Office Initial Transfer Approval (Outside the Office)

14. Region or Office Final Transfer Approval (Outside the Office)
15. Create New Document
16. Publish a Document
17. Create a Routing Document
18. Search Routed Document
19. Receive Routed Document
20. Release Routed Document
21. Tag Routed Document as Terminal
22. Search Published Document

The above test name includes description, requirements, pre-requisites, action, expected results, observed results, and if pass or fail.

After the testing, users gave suggestions and found bugs in sending notifications from emails where the registration did not send the message to the user after the registration. Still, in some cases, it was successful in other processes. In this case, after solving the bugs, I used regression testing, where the users have to test other modules related to the registration to make sure that there will be no new bugs due to the changes made to the system.

Lastly, was conducting the system's assessment. The System Usability Scale (SUS) was used to evaluate its usability in this assessment. The SUS provides a "quick and dirty," reliable tool for measuring usability. It consists of a 10 item questionnaire with five response options for respondents, from Strongly Agree to Strongly Disagree [6]. Below are the questionnaire and the result of the assessment:

System Usability Scale Questionnaire [6]

Full Name	1	2	3	4	5	6	7	8	9	10
	I think that I would like to use EDMTS frequently.	I found EDMTS unnecessarily complex.	I thought EDMTS was easy to use.	I think that I would need the support of a technical person to be able to use EDMTS.	I found the various functions in EDMTS were well integrated.	I thought there was too much inconsistency in EDMTS.	I would imagine that most people would learn to use EDMTS very quickly.	I found EDMTS very cumbersome to use.	I felt very confident using EDMTS.	I needed to learn a lot of things before I could get going with EDMTS.
Cristiefel Ramos Saldevar	5	4	4	4	4	2	4	2	5	1
Igie Tapawan	5	5	4	1	5	1	5	1	5	3
Joan C. Addun	5	5	5	1	5	1	5	1	5	3
Ma Cristina V. Jaca	5	2	5	1	4	1	5	1	5	2
Tiffany Galanida	5	4	5	2	5	1	5	1	5	1

Measuring and Interpreting System Usability Scale (SUS) [7]

SUS Score	Grade	Adjective Rating
> 80.3	A	Excellent
68 – 80.3	B	Good
68	C	Okay
51 – 68	D	Poor
< 51	F	Awful

Computation [7] and Result:

	X = Odd(Sum)-5	Y = 25-Even(Sum)	SUS Score = ((X+Y)x2.5)	Average SUS Score
Cristiefel Ramos Saldevar	17	12	72.5	84.5
Igie Tapawan	19	14	82.5	
Joan C. Addun	20	14	85	
Ma Cristina V. Jaca	19	18	92.5	
Tiffany Galanida	20	16	90	

As you observed, the overall system assessment of usability is 84.5, equivalent to an excellent rating.

Security Testing

The OWASP ZAP tool was used to identify the vulnerabilities of the EDMTS. In this tool, four types of alerts were raised: High Priority Alert, Medium Priority Alert, Low Priority Alert, and Informational Priority Alert [8]. Fortunately, no High Priority Alert was detected, but five alerts were recorded from Medium to Informational Priority alerts and needed to be resolved.

The first alert raised was the vulnerability in the JavaScript library where it was not the latest version of the file, and to address the issue, the jQuery file was upgraded to version 1.13.1. The second was the “Cookie No HttpOnly Flag,” which means that the JavaScript can access the cookie, and if this is a session cookie, then session hijacking may be possible. The “SESSION_SECURE_COOKIE” from the session.php of the Laravel file must be set to “TRUE.” to address the “Cookie No HttpOnly Flag” issue. The third issue was the “Cookie without SameSite Attribute,” meaning the cookie can be sent due to a ‘cross-site’ request. The SameSite attribute is an effective countermeasure to cross-site request forgery, cross-site script inclusion, and timing attacks. To address the issue on SameSite, it should set the “’same_site’ => ‘lax’” from the session.php file. Lastly, the rest was the “Information Disclosure – Suspicious Comments,” some of the scripts appear to contain suspicious comments that may help an attacker. To address the issue, remove all comments that return information that may allow an attacker and fix any underlying problems they refer to.

The OWASP ZAP provided solutions but was not detailed on how to address the issue in a step-by-step approach, and it had to search for the detailed solution on the internet.

Chapter V

DISCUSSIONS

Gathering the requirements in the very first stage is very challenging. It started by identifying all the personnel involved since I had to consider their availability to schedule an interview and approval from their superiors first. In addition, I needed the same approval and checking of the available schedule and place until the user testing stage. In that case, I had to choose personnel within my unit to help me deliver the task of scheduling the meeting without any conflict with their time and task in the office. They are also the people who will most benefit from the system since it is more on creating the documents, routing, and publishing.

On the technical side, choosing the right application or framework to build a system is a challenge because you have to consider the skill of other programmers who may work on the system. In addition, challenges such as what operating system, database, and server to install and use. All the mentioned challenges needed a lot of research in determining the pros and cons before choosing among the list of choices, considering my limited knowledge of a particular application and the available resources. Before the coding started, I had to choose between CodeIgniter and Laravel framework. And since the last framework I used in developing my previous web application was the Laravel, I had to select the Laravel framework over the CodeIgniter, where the Laravel has a great documentation and integration with mail services [9]. I mostly encountered problems during the development, mainly while coding the application, such as runtime or bugs, syntax errors, and compile errors.

Linux and Windows were my only choices for the server's operating system. Linux has the advantage of low memory usage since it doesn't use GUI [10] and is highly secure [11], but the only downside is that it requires a relatively experience

Linux administrator [12]. Instead, I decided to use and run the application through Windows Server 2016 because I have the license to use, memory resources, and the experience to manage the Windows operating system.

The EDMTS was previously installed on a local computer where the application, database, and web service were installed. At that time, all were working well; another pc was able to access the application and use the system, including sending an email. After the migration to the Windows server and conducting complete cycle testing, the system raised an error when sending an email and the URL of the application was unable to access. Only to find out that the incoming firewall was blocking a specific port used by the application and just needed to make an exception from the firewall. Other applications, such as the Apache server had to change the port number due to the conflict with the existing localhost default port 80.

Sending the email was the trickiest I encountered when migrating the application system from the local PC to Windows Server. During the development, sending notifications after user registration, creating a document, and routing the document worked properly. I used the Gmail SMTP server and Mailrap to test the incoming and outgoing emails, and it was successful. After the migration, suddenly, all notifications from the email were not working. After in-depth analysis, I found out that the IP address of the server I have been using has to add to the relay server to use the domain name in the email address and the Domain Name Service to figure out where the email should be sent [13]. In addition, port 25 is used instead of port 587, which makes sending emails successfully.

Four types of software maintenance shall be performed when needed after the application has launched; preventive, perfective, adaptive, and corrective software maintenance [14]. Preventive software maintenance shall be performed quarterly, and

these include; defragmentation and optimization of tables in the EDTMS database and Windows Server hard drive. In addition to the preventive of the Windows server, where the database and web server are installed, it shall regularly update the OS and perform a disk cleanup to delete unnecessary files and logs to free up drive space. Perfective software maintenance only is performed if there are additional changes or removal of features in the system. Next is adaptive software maintenance. This type of maintenance is only performed normally if there is migration to other operating systems such as Linux or shifting to other databases such as Oracle, systems that need adjustment to adapt to the changes and make it work. Lastly, the corrective software maintenance, which is due to the effect of the three-above maintenance, like changing the patches that are not compatible with the system or the cause of faults, bugs, and errors, shall be immediately performed.

Chapter VI

CONCLUSIONS

Digitalizing the process is one of the main goals of this project. And through digitalization, common issues encountered from conventional receiving, releasing, approving, and publishing of documents can solve or lessen the effect of the problem. EDMTS is a web application that brings digital transformation to many processes that result in workflow efficiency and an advantage in managing documents.

Using the EDMTS effectively within the corporation ensures the fast turnaround time of the approval of documents and cost savings on reducing the paper, which is also one of the crucial steps toward a paperless office. In addition, EDMTS helps every employee easily access published documents, and third-level management retrieves the created document quickly at anytime and anywhere in the office or region.

It is also proven that EDMTS is an easy-to-use application that most users find easy to operate and easy to learn from doing the task of routing a document. Also, a useful application makes personnel accomplish the job more quickly and improves their performance, resulting in increased productivity in managing documents. Therefore, it is important to enhance the system and continue the best practices to gain advantage and efficiency in handling the documents.

Chapter VII

FUTURE WORK

The digital signature is planned to integrate with EDMTS to fully implement the paperless system when approving the document by transmitting it to various offices and personnel requiring a signature in one document. Also, creating various reports and audit trails for every transaction in the system is one of the system enhancements. It includes the creation of a user manual and user training. Lastly, the system will be set up in other regional offices and published outside the corporation to make it accessible for work-from-home users.

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