



**DOCUTRACKER: A WEB BASED DOCUMENT MANAGEMENT INFORMATION
SYSTEM FOR DAVAO ORIENTAL STATE UNIVERSITY**

**Ivan Dawang
Patrick Gerald Heyres
Cleo Khaye Marie Marohom**

**A BSIT Capstone Project Submitted to the Faculty of Computing, Data Sciences,
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Fulfillment of the Requirements for the Degree**

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Republic of the Philippines
DAVAO ORIENTAL STATE UNIVERSITY
Faculty of Computing, Data Science, Engineering, and Technology
Guang-guang, Dahican, 8200, City of Mati, Davao Oriental



ACADEMIC INTEGRITY DECLARATION

We, **IVAN P. DAWANG**, **PATRICK GERALD W. HEYRES**, and **CLEO KHAYE MARIE E. MAROHOM**, declare that this Capstone/Thesis is our original work. Most stipulations are presented herein and ours alone. Borrowed ideas are given due recognition and are appropriately acknowledged. To the best of my ability, this investigation was treated with utmost care to adhere to internationally known standards/policies on academic integrity.

We attest further that this piece of academic requirements has not been submitted previously for an academic credit in this or any other courses.

IVAN P. DAWANG

Researcher/Author

Date: _____

CLEO KHAYE MARIE E. MAROHOM

Researcher/Author

Date: _____

PATRICK GERALD W. HEYRES

Researcher/Author

Date: _____

FEBRUARY 2024

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The Researchers

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CHAPTER I

INTRODUCTION

1.1 Rationale of the Study

In the modern day, most common problem faced by most organizations when it comes to physical document papers is document loss: 75% of all corporate 12 documents are misplaced and never discovered. The time spent looking, as well as the privilege of replacing a lost document, is a huge loss of time and resources. The loss of documents can be a major problem for organizations. When documents are lost, it can lead to wasted time and resources, as well as potential legal and financial consequences (Bentech, 2022). This is no different for Davao Oriental State University (DORSU).

Without a document management system, documents can be difficult to locate, and their status can be unclear. This can lead to wasted time searching for documents, as employees spend hours scouring through physical files only to find that the document is either missing or forgotten. Moreover, the lack of transparency in document status can result in potential errors in document approval, as stakeholders may not have access to the most current version or may not be aware of changes made to the document. Furthermore, the absence of a document tracking system can also lead to compliance issues due to missing or outdated documents, which can result in fines, penalties, or even legal action. This can be particularly problematic for organizations that are subject to strict regulatory requirements or industry standards, where document accuracy and timeliness are crucial for maintaining compliance and avoiding legal consequences.

Implementing a document management system can help prevent these problems by providing features such as document metadata, search functionality, status tracking,

etc. This ensures that documents are easily accessible, and securely managed throughout their lifecycle.

DOCUTRACKER is a Web-based document tracking system that offers DORSU a seamless tracking solution. This system has the potential to reduce time and effort spent locating documents, provide awareness of the whereabouts of documents, and guarantee efficient and secure tracking. Implementing a document tracking system like DOCUTRACKER can lead to improved efficiency, enhanced security, reduced errors and misplaced documents, better collaboration of routes that documents need to go through, and reduced cost (Q. Techopedia, n.d. 2019).

A related global study about document tracking are as follows; Publuu Interactive Online Flipbook. Publuu is a cloud-based platform for modern companies that enables them to produce, organize, and monitor all of their business documents in one location through Flipbook PDFs. It is one of the document tracking systems in real-time and enables you to share multiple trackable links for each recipient or group you wish to track. This is one of the useful things that differentiates Publuu from other document-tracking technologies on the market. (MD. Carolina Monntoya, 2023)

The Department of Social Welfare and Development Field Office V is implementing a web-based electronic document tracking management system to streamline document transactions. The system, which includes identifying, classifying, storing, securing, retrieving, tracking, and preserving documents, is designed to improve communication between clients and staff, enhance document tracking, and make information more accessible. The system is fully functional and is expected to improve the processes of the DSWD Field Office V, enhancing overall efficiency and effectiveness. (K. Smith Shoen, 2016)

DOCUTRACKER, is driven by the need for an efficient and organized document management system within the university. The current manual document tracking processes at DOrSU are prone to errors, delays, and inefficiencies, leading to challenges in maintaining accurate records and ensuring timely access to information. The implementation of DOCUTRACKER aims to address these issues by leveraging web-based technology to streamline document tracking, enhance collaboration among university departments, and improve overall administrative efficiency. The system is designed to automate document creation, tracking, and retrieval, providing a centralized platform for users to monitor the status of documents in real-time. The study seeks to evaluate the impact of DOCUTRACKER on reducing administrative bottlenecks, enhancing workflow efficiency, and ultimately contributing to the overall effectiveness of document management at Davao Oriental State University.

1.2 Purpose and Project Description

The purpose of this project is to provide Davao Oriental State University (DOrSU) with a comprehensive document management information system that tracks documents to simplify the process and boost the overall workflow.

1.3 Objectives of the Study

The main objectives of the project are to develop and design a web application that allows users to track the whereabouts of their documents and to notify the users as well, which aimed to.

1. To design and develop a system that is capable of:
 - Using a QR Generator to generate code when registering a document;
 - Providing a document real-time status reporting for under-going documents;
 - Providing a total lifecycle time of document when completed as well as calculates and visualize the time taken of each route, and;
 - Providing downloadable data for offline access of reports;
2. Asses the **DOCUTRACKER: A Web Based Document Management Information System for Davao Oriental State University** to determine if it complies with IEEE 25010
3. Craft an Implementation Plan for the rollout of the **DOCUTRACKER: A Web Based Document Management Information System for Davao Oriental State University**

1.4 Significance of the Study

This paper aims to develop a web-based platform document information management system for preventing document loss and to process documents more effectively and efficiently.

Collected data can help future researchers understands and to be aware of the constraints we've encountered, the problems, and the solution itself. Future researchers can use the data for future research and/or expands the knowledge and develop more optimized and suitable solution for a better good.

1.5 Scope and Limitation

1.5.1 Scope

- The document management information system has its main features which are the Manage registered accounts, manage documents and view document status for admin interface, while the Register Document, View Document Status and User's profile is for user's interface and the Document register approval and view document status for receiver's interface.
- The main focus of the system is in every faculty in Davao Oriental State University (DorSU) that includes the following which is the Faculty of Computing, Data Sciences, Engineering and Technology (FCDSET), Faculty of Nursing and Allied Health Science (FNAHS), Faculty of Teacher Education (FTED), Faculty of Agriculture and Life Sciences (FALS), and Faculty of Governance, Business and Management (FGBM).
- The process of document tracking has its different processes and receiver flow in every document. There are some documents that are from faculty, and there is a document that is outside of faculty process.
- For the process of "Faculty Loading", it will undergo to program head, Dean and to the academic VP.
- For the process of "Requested Subject", it will undergo to program head, dean, and to the VP.
- For the process of "Endorsement Form", it will undergo to communication, faculty program head, faculty dean, VP, and to the OP, once it is done, it will be approved.

1.5.2 Limitation

- This system will be implemented only at Davao Oriental State University main campus.
- The system only tracks selected documents, (Faculty Loading, Requested Subject, Endorsement Form).
- Only the selected users can use DOCUTRACKER, (Program Head, Dean Office, Academic VP, OP, Secretary).
- The system needs internet connection in order to be accessible.

1.6 Conceptual Framework

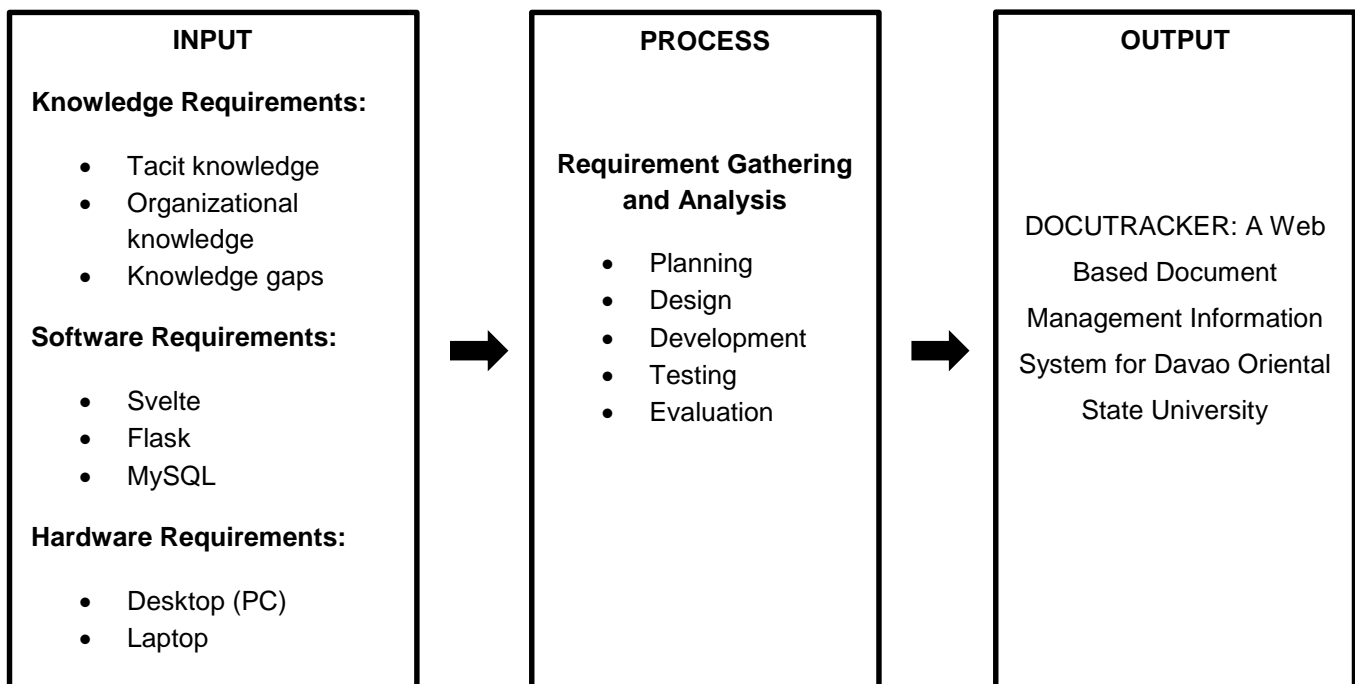


Figure 1.1: Conceptual Framework

1.7 Definition of Terms

User Requirement/Specification:

The user requirement document or user requirement specification is a document usually used in software engineering that specifies what the user expects the software to be able to do.

Data Collection/Gathering:

is the process of gathering and measuring information on targeted variables in an established system, which then enables one to answer relevant questions and evaluate outcomes.

Requirement Gathering and Analysis:

is a process used to determine the needs and expectations of a new product. It involves frequent communication with the stakeholders and end-users of the product to define expectations, resolve conflicts, and document all the key requirements.

CHAPTER II

REVIEW OF RELATED LITERATURE

2.1 Technical Background

For the development of the system entitled DOCUTRACKER: A Web Based Document Management Information System for Davao Oriental State University. The researchers indicate the following programming language and libraries that is going to be used that is stated below:

2.1.1 Svelte

Is an innovative tool for building interactive UI (User Interface), unlike traditional JS libraries that do most of their work in the browser, Svelte shifts that work into a compile step that happens when you build your app. This results in highly efficient code that updates the DOM at incredible speed. Svelte is a compiler, you can't just add a script tag to your page and import it into your app. You'll have to set up your development environment to let the compiler do its job. Components are the building blocks of Svelte applications. They are written into svelte files using a superset of HTML. The Svelte compiler converts your components to JavaScript that can render the HTML for the page and to CSS that styles the page.

In DOCUTRACKER, Svelte is used to build the UI of the application. Svelte is a front-end library that's designed to build interactive UI running in a browser. It doesn't use a virtual DOM, instead, it compiles code into optimized vanilla JavaScript, which minimizes overhead at runtime and boosts application performance (Nakajima, 2021).

Svelte components, which are written into svelte files using a superset of HTML, are the building blocks of Svelte applications (Anonymous, 2016). These components encompass the logic, style, and markup of a part of the user interface. For instance, in a DOCUTRACKER, there might be Svelte components for displaying a list of documents, a detailed view of a selected document, a form for creating new documents, and so on.

2.1.2 MySQL

MySQL, an acronym for "My Structured Query Language," is an open-source relational database management system (RDBMS) renowned for its efficiency and versatility. Developed by MySQL AB and now owned by Oracle Corporation, it forms an integral part of the widely adopted LAMP stack, alongside Linux, Apache, and PHP/Python/Perl. Operating across various platforms such as Linux, Windows, and macOS, MySQL organizes data into structured tables with rows and columns, facilitating efficient management and retrieval of information.

With its robust performance, scalability options, and advanced security features, MySQL is a popular choice for diverse applications, ranging from web development to data-driven software solutions. Its open-source nature fosters an active community of developers, contributing to ongoing improvements and support. MySQL's ability to handle large datasets, execute complex queries swiftly, and seamlessly integrate into various environments underscores its significance as a reliable and widely used relational database management system in the realm of modern computing.

2.1.3 Flask

is a small and lightweight Python web framework that provides useful tools and features that make creating web applications in Python easier. It gives developers flexibility and is a more accessible framework for new developers since you can build a web application quickly using only a single Python file. Flask is also extensible and doesn't force a particular directory structure or require complicated boilerplate code before getting started. Flask takes a radically different approach to creating web apps. It's a micro framework, equipped only with the web app development essentials. Its strength lies in its customizability. Flask is flexible, allowing you to experiment and switch directions easily.

DOCUTRACKER used flask for the backend to handle data manipulation, authentication/validation, database integration and other server side operations.

2.2 Related Literature

The study entitled "A Data Centre Configurable Data Mining Document Management Information System, 2021" conducted by Gurusubramani, S., Mouleeswaran, S. K., Srinivas, P., & Aruna, R., it states that Electronic information development in many aspects of human practices, from research to industry, has been rising rapidly over the past two years. Every day very large data sets are manufactured from cameras, instruments, handheld devices and computers. Effective technologies are also needed to incorporate flexible data collection workflows through the use of cloud-based storage platforms, where data is stored even more regularly. The paper attempts

to show how cloud infrastructure is implemented to introduce an optimized framework in which scalable data analyzation workflows can be planned and performed. We explain how the Data Mining Cloud Architecture is built and applied and a data analytics method that incorporates visual workflow vocabulary, parallel to the Virtualized environment. DMCF is developed with a view to simplifying the creation of applications for data mining associated with generic system monitoring schemes that are not created especially for this area, in view of the specifications of actual data mining applications.

The study entitled “Electronic Document Management Information System for Universities, 2018” conducted by Costoiu M., Plesu V., Isopescu R., Soriga S., Alesincu S., Arsene I., it states that Efficient administration of funds and thorough correlation of diverse activities are required in the management of Higher Education institutions. The electronic document management information system implemented in the University is continuously up-graded in order to provide a tool for an efficient management. A preliminary identification was performed to take into account all the aspects referring to the numerous documents in circulation in the University and the problems raised by the necessity that some supported documents should be digitized. They also mentioned that while using the document management system, the documents may be created by an author or introduced in the system by means of scanning, automatic import from file systems or other applications, by e-mail or by automatic generation based on forms.

In addition, the study entitled “Interrelationship between document management, information management and knowledge management, 2017” conducted by N. Sewdass, it states that the Documents are the natural by-products of the activities of an organization. Information and knowledge are perceived as very important assets for organizations. Managing documents, information and knowledge can contribute to

business efficiency and effectiveness for organizational competitiveness. The three concepts document management, information management and knowledge management are becoming increasingly prevalent in academic and vocational literature. Although these concepts have been used and discussed over and over, there remains ambiguity about them, confusion between them, and little consensus on how to perform them.

This study “System Development for Document Management System, 2018” conducted by Kiplie, Yatin, Angutim, & Hamid, it states that Digitization systems should always support the sharing of views or movement of data from other systems, regardless of the level of integration selected. System development is a formal set of process to define, design, testing and implementing a new software application or program. This includes the process of internal development in order to customize the systems, and creating the database system as well. Digitization system offers to organization in capturing important materials that can be treat as an important information and knowledge for users either for business, study, or research purposes. According to Kroenke (2015), Information system is an organized system of information that functions it collect, organized, store, and communicate the information. Specifically, information system is a group of connected people and organization to collect, filter received information or data, process, create and distribute the date to specific users. So, information system can be concluded as a group of components that interact together to create, produce and disseminate information.

A study entitled “Electronic Document Management System: Malaysian Experience, 2021” conducted by Yatin, S. F. M., Ramli, A. a. M., Shuhaimi, H., & Kadir, M. R. A., it states that Document management systems have long been touted as the

answer to many paper-related problems. They seem to offer the opportunity to exercise a high degree of control over the ways in which paper documents are handled. The latter are sometimes referred to as “enterprise or electronic document management systems”. It is important to realize that document management systems do just that they manage documents, not the information or knowledge contained within the documents. Thus, their impact on a business is in the efficiency they provide in document storage and retrieval and also information access. The time has never seemed to be right to opt for this system, there has always seemed to be such ongoing development that the “ideal” system must be just around the corner. As the awareness of computers as a tool for data processing increased, more organizations and institutions began to acquire computers for their record keeping. One of the seven flagships in Vision 2020 focuses on the area of record keeping and document management is Generic Office Environment-Electronic Government Document Management System (GOE-EGDMS). This study is designed to investigate the usage and effectiveness of the implementation of GOE-EGDMS adopting the IS Effectiveness Model from DeLone and McLean.

A study entitled “eGovernment Document Management System: A case analysis of risk and reward, 2016” conducted by Jones, S, it states that The effective deployment of an electronic document management system (EDMS) is an important element in establishing a virtual workplace environment and transforming the capabilities of a modern organization and its workforce (Adam, 2007). EDMS can empower users to streamline business processes via workflow and information sharing, which can also improve information management (Hammer & Hershman, 2010). Read (2009) highlights that operational efficiency can be transformed through the deployment of IT in back office functions. This is especially the case with EDMS implementations (Wilkins, Swatman, & Holt, 2009). There is also increasing recognition that efficiencies will come

from common IT systems and common business processes in the public sector (Gershon, 2004). With the growing need for the public sector to embrace more technology and be more innovative, organizations are increasingly implementing IT systems in an attempt to transform service delivery, both internally to the organization and externally for the citizen. This case analysis investigates how the EDMS was initiated and implemented. It draws upon the literature and case study findings to propose a good practice framework to help assess the value, benefit and risk of an electronic document management system to help ensure it meets the desired outcomes.

2.3 Related Systems

2.3.1 THE UNIVERSITY OF THE PHILIPPINES DOCUMENT TRACKING SYSTEM

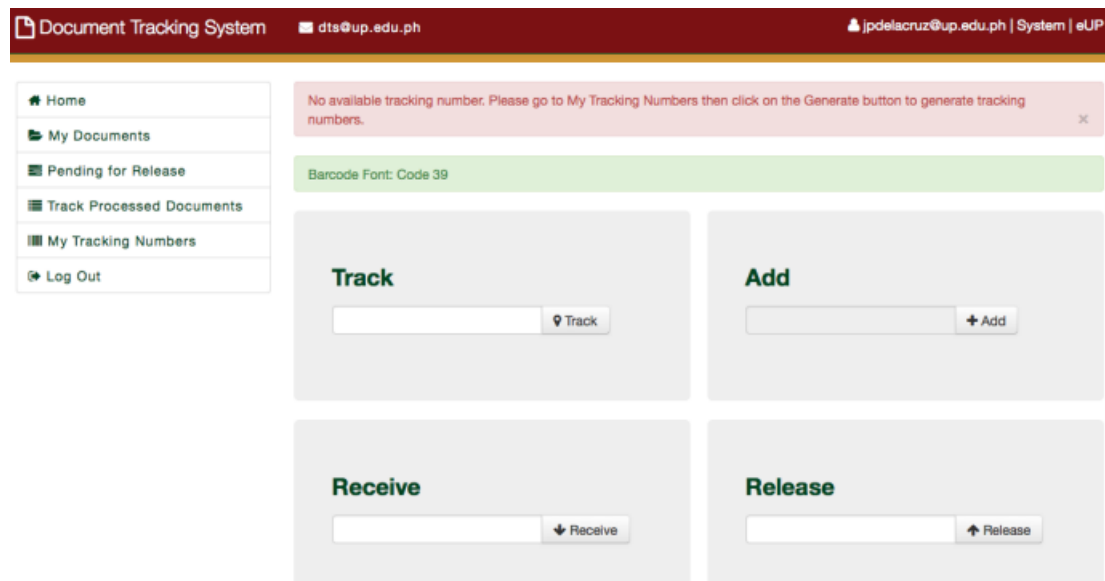


Figure 2.1 University of the Philippines Document Tracking System Interface (UPITDC, 2022)

The Document Tracking System (DTS) at the University of the Philippines (UP) is an information system designed to monitor the flow of paper documents across UP

offices. It captures details such as the origin and destination offices, personnel involved, and the time taken for documents to move between offices, units, or departments. The DTS also provides support for document attachments, revisions, updates, and remarks, enhancing its functionality and usability.

In today's rapidly advancing technological landscape and the growing importance of efficient information management, the emergence of document tracking systems has provided a solution to enhance the accessibility of documents online, whenever needed. Given the common tendency of document workers to lose track of document paths, it is imperative for these systems to effectively trace the movement of documents from their origin to their intended destinations. Although some corporate and educational institutions may believe that transitioning from paper-based processes is unnecessary, the significance of adopting such practices has never been more critical. However, determining the appropriate timing and method for transitioning from paper to digital documents can be a challenging task.

2.3.2 M-FILES: DIGITAL DOCUMENT MANAGEMENT

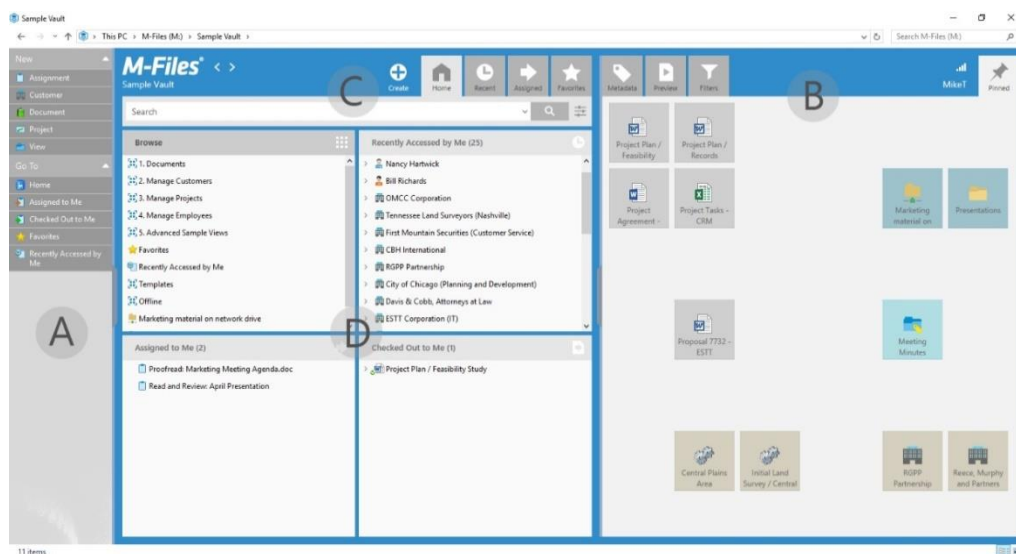


Figure 2.2 M-Files: Digital Document Management Interface (M-FILES, 2018)

-generation intelligent information management platform M-Files provides answers to all the problems associated with managing digital documents. M-Files offers a fundamentally different approach to document management in addition to a set of effective enterprise content management technologies, completely altering how businesses organize information. M-Files prioritizes metadata labeling to make documents easy to identify, find, and incorporate into operations rather than classifying them based on where they are stored. A document's metadata can include everything from the name of a client or project to the person who developed it, the format of the information it contains, the people who need to see it and in what sequence, invoice and project numbers, due dates, and any other information. (M-Files, 2021)

2.3.3 GLOBODOX DOCUMENT MANAGEMENT SOFTWARE

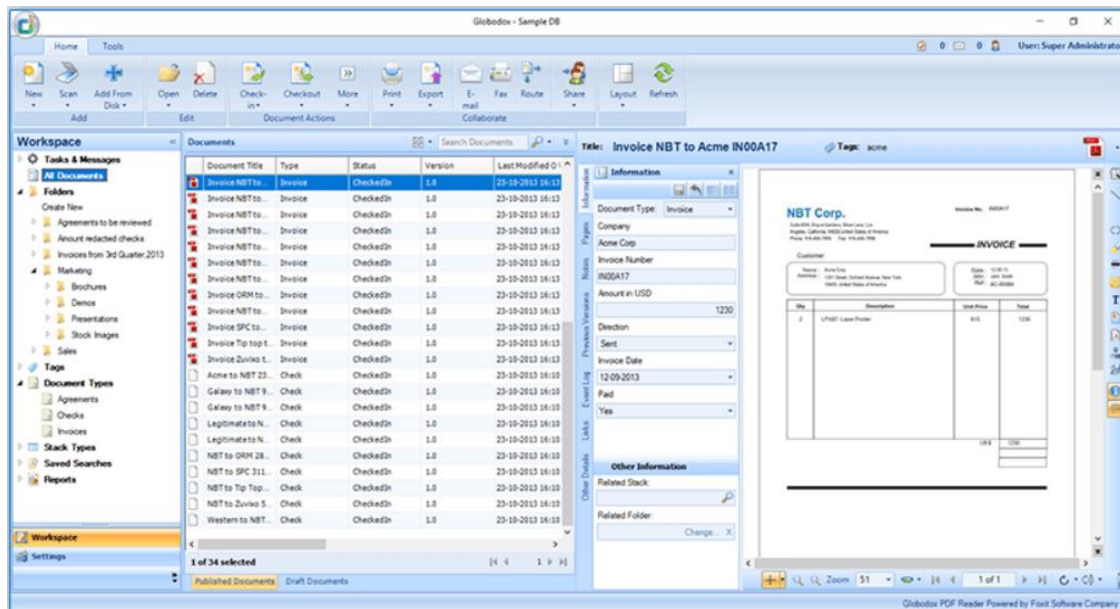


Figure 2.3 Globodex Document Management Software Interface (GLOBODOX, 2023)

GLOBODOX document management system solutions let you organize, manage, share, and communicate business-critical information. It can meet the needs of organizations of any size. GLOBODOX comes with modules such as workflow, document retention policy, customer portal, etc, GLOBODOX DMS is easy to install, easy to configure, and easy to use the system. GLOBODOX DMS is affordable for small, medium, and large organizations. GLOBODOX is used by SMB and large enterprises in Government, Banking, Financial Services, Insurance, Healthcare, Legal, Education, Service, Manufacturing, Technology, Real Estate and Consultancy industries. It features an integrated set of tools that let you scan, index, search, secure and share documents and keep an audit trail. Using workflow, GLOBODOX helps you route documents electronically to help you automate your business processes.

2.3.4 FOLDERIT CLOUD DOCUMENT MANAGEMENT SYSTEM

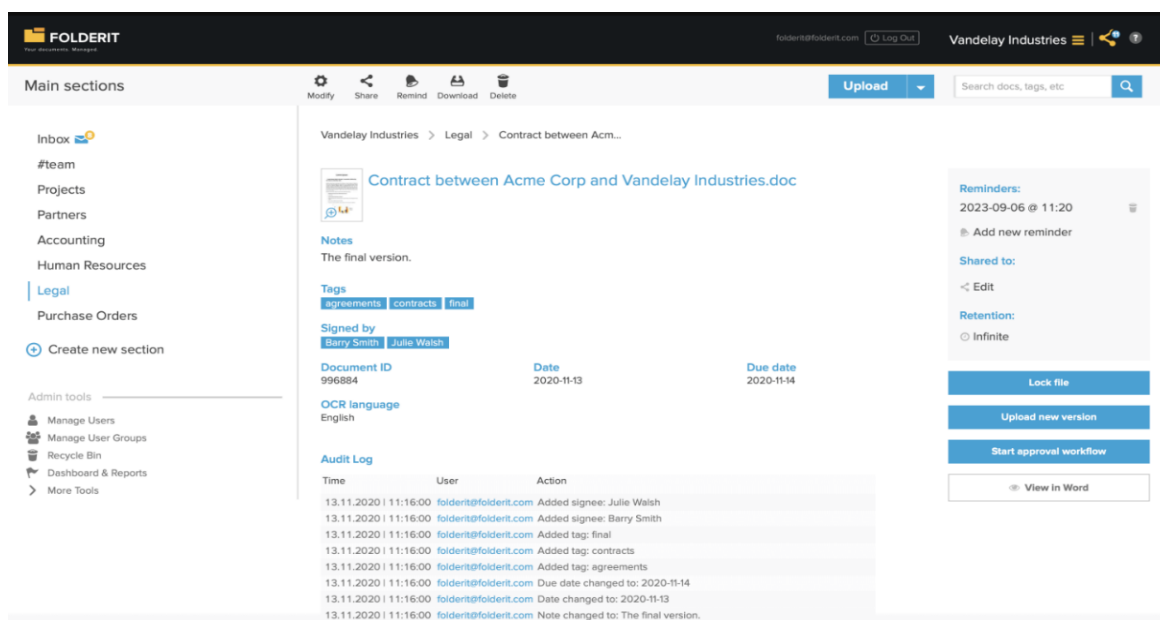
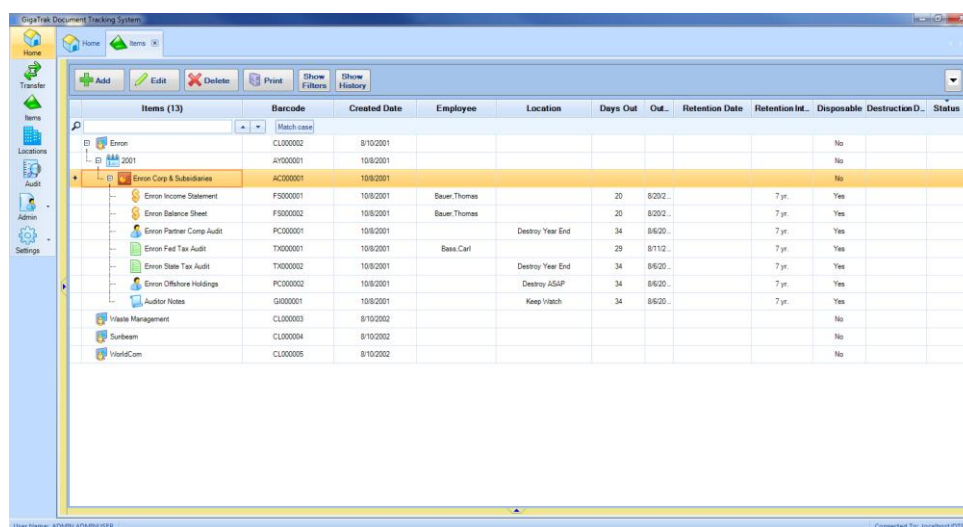


Figure 2.4 Folderit Cloud Document Management System Interface (FOLDERIT, 2023)

Folderit provides an easy to use document management system software where you can store, manage, share, and gain better control of all digital documents. But don't take just our own word for it — Folderit was named the most user-friendly document management system in the world! Folderit provides a secure offsite cloud-based DMS to keep your important data safe from risks of fire, hardware failure, criminals, floods and other natural disasters. It's the best DMS for both small and medium businesses.

2.3.5 GIGATRAK DOCUMENT TRACKING SYSTEM



Items (13)	Barcode	Created Date	Employee	Location	Days Out	Out	Retention Date	Retention Int.	Disposable	Destruction D.	Status
Enron	CL000002	8/10/2001							No		
Enron 2001	AP000001	10/8/2001							No		
Enron Corp & Subsidiaries	AC000001	10/8/2001							No		
Enron Income Statement	F5000001	10/8/2001	Beuer, Thomas		20	8/20/...		7 yr.	Yes		
Enron Balance Sheet	F5000002	10/8/2001	Beuer, Thomas		20	8/20/...		7 yr.	Yes		
Enron Partner Comp Audit	PC000001	10/8/2001		Destroy Year End	34	8/6/20...		7 yr.	Yes		
Enron Fed Tax Audit	TX000001	10/8/2001	Bass, Carl		29	8/11/2...		7 yr.	Yes		
Enron State Tax Audit	TX000002	10/8/2001		Destroy Year End	34	8/6/20...		7 yr.	Yes		
Enron Offshore Holdings	PC000002	10/8/2001		Destroy ASAP	34	8/6/20...		7 yr.	Yes		
Auditor Notes	GA000001	10/8/2001		Keep Inreach	34	8/6/20...		7 yr.	Yes		
Visa Management	CL000003	8/10/2002							No		
Sunbeam	CL000004	8/10/2002							No		
WorldCom	CL000005	8/10/2002							No		

Figure 2.5 GigaTrak Document Tracking System (Gigatrak, 2018)

The GigaTrak Document Tracking System is a flexible solution for nearly any organization that needs to track documents and materials assigned to a person or location. GigaTrak Document Tracking System uses barcodes to identify employees, locations, and material items, keeping costs low yet accuracy high. The user simply scans the employee or location barcode using a handheld Android device and then each document barcode being assigned. Documents can then be located quickly with a full chain of custody report available. Simple, effective, and quick to implement. With the use

of existing cell phone cameras for individual barcode scans or a dedicated Android PDA with an integrated barcode scanner for rapid scanning of multiple documents.

The GigaTrak Document Tracking System can help you track where your documents and material items are quickly and easily. Every organization has documents and materials that must be tracked until you no longer need the items.

2.4 Synthesis

DOCUTRACKER is a web-based Document Management Information System developed as a capstone project for Davao Oriental State University. It addresses the university's need for an efficient document management system that can handle both physical and electronic documents. The system will be developed through a comprehensive needs analysis involving surveys, interviews, and focus groups, which identified the university's specific requirements and challenges in document management.

This system, namely "DOCUTRACKER" will be built with Svelte and Flask, that offers tracking services and a user-friendly interface. It utilizes MySQL to securely store, manage, and maintain all university documents. Advanced search capabilities and tagging systems allow users to quickly retrieve needed document data.

The related literature of the study emphasizes the relevance and importance of document management information systems and how they can be helpful in every organization. Based on these articles, different perspectives and objectives emerge regarding the assessment of document tracking systems, even though they share the same intention for implementing document tracking.

Implementing a Document Tracking System can make it simple for DORSU to keep track of all its documents where the system's main goal is to provide secure tracking of documents. The system's user-friendly interface may minimize the need for extensive training or technical support, further streamlining the document management process.

Features	Proposed study	Existing Document Management System/Document Tracking System				
	DOCUTRACKER: Web Based Document Management Information System	The University of the Philippines Document Tracking System	M-FILES Digital Document Management	GLODOBOX Document Management Software	FOLDERIT Cloud Document Management System	GIGATRAK Document Tracking System
Web based platform	YES	YES	NO	NO	YES	NO
Request Document	YES	YES	YES	NO	NO	NO
View Request Status	YES	YES	NO	NO	NO	NO
Able to track document request by entering track code	YES	YES	NO	NO	NO	YES
Able to generate QR with tracking code	YES	YES	NO	NO	NO	NO

Table 2.1: Tabulated Comparison of the System's Feature

CHAPTER III

MATERIALS AND METHODS

3.1 Software Methodology

The system uses Agile methodology, is a collaborative, iterative approach to software development that emphasizes user input, cooperation, and continual improvement. Its concepts were first developed for software development, but they are now used in many different disciplines and sectors. A few key concepts include incremental delivery, cross-functional teams, face-to-face communication, functioning software over documentation, self-organizing teams, regular reflection and improvement, and transparency.

Implementing the Agile methodology in DOCUTRACKER can result in better transparency, faster value delivery, more user happiness, and the flexibility to meet changing requirements efficiently. Agile methodology is a structured way for creating efficient and adaptive tracking management systems by embracing iterative development, visual tracking, constant feedback, and empowered teams.

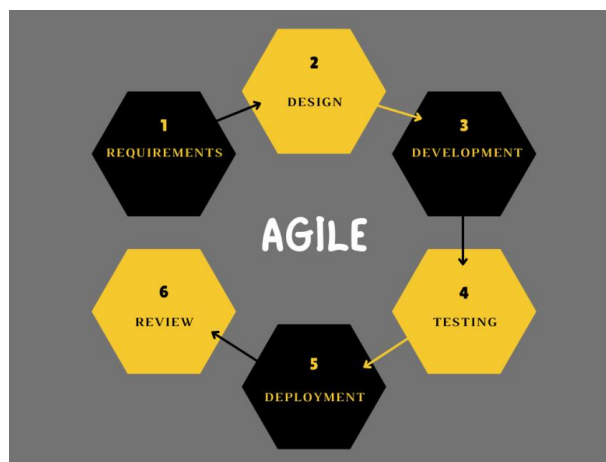


Figure 3.1. Agile Methodology Model (MEDIUM, 2020)

Requirements:

In this process the researchers built a plan on how the document information management system would be developed. This was accomplished by defining the purpose and goal of the system and determining and documenting the user requirements and system needs.

Design:

In this process, the researchers constructed and finalized the design of the system and the user interface. This was achieved by using a prototype and wire framing tools for the implementation of the design.

Development:

In this process, the proposed system was developed based on the plans made by the researchers. It was done by using a programming language for the back end of the system, and the design was constructed through a prototype for the front end of the system.

Testing:

Once the development of the system is done, it undergoes a testing process in which the researchers perform tests to check for errors or mistakes in the coding and to ensure that it functions properly, meeting all the objectives outlined in the plan.

Deployment:

In this process, the system is ready for the deployment or implementation of the document information management system since the testing process had been

completed, and this system will be implemented at DORSU. Also, the system was ready to assist the users with their documents.

Review:

In this process, the researchers will provide some maintenance for the future development and needs for the system. It will also base on the feedback of the users.

3.2 Requirements Analysis

The researchers analyzed the requirements and information needed to ensure that the system will work perfectly and to provide services to the users, and ensures the user-friendly interface of the system. In order to develop the system, the researchers gathered the requirements needed for its development and discussed the system's structure and design that is needed based on the information gathered.

3.3 Requirements Documentation

3.3.1 System Architecture

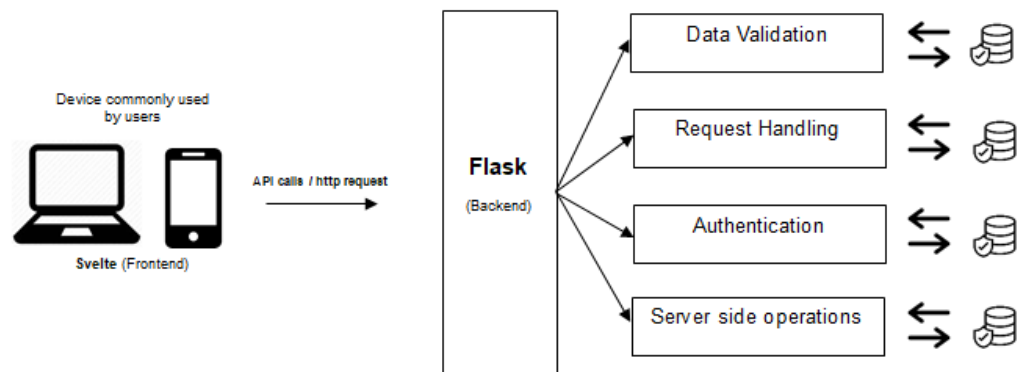


Figure 3.2: Micro-Service Architecture

When the frontend needs data, it sends an HTTP request to the Flask server. The server processes this request and sends back a response, which the Svelte app then processes and uses to update the UI. This separation of concerns allows for better code organization, easier debugging, and the potential for each part to scale independently.

3.4 Requirements Specifications

This document management system or “DOCUTRACKER”, is a web-based system for Davao Oriental State University (DORSU), that helps the user to reduce the time of effort of processing their documents. The system is able to notify the user on the progress of their tracked and ensures the smooth flow and secure tracking of documents.

3.4.1 Product Perspective

This web based DOCUTRACKER system allows user to add a document to be tracked whether that user is in the campus or not since it can be accessible wherever they are as long as it is connected in the internet. Once the user is done adding a document, they can be able to see the progress of the document.

3.4.2 Product Features

DOCUTRACKER is designed to manage documents, and within the area of processing documents, the system provides information and data such as status, time visualization, etc. in which can be absorbed by the end user, the system also notifies the user about every piece of process in their document.

User Class and Characteristics

3.4.2.1 User

Users can add document in which the system can process, Users can see the status and progress of documents, Users cannot manage other user's credentials.

3.4.2.2 Receiver

Receivers receives documents such as approves/rejects them and they opt for the system to process documents, the data of the process will be thrown back to the end user, they can only process documents that it is meant for them, Receiver cannot view data of documents and can't see other receiver's processes.

3.4.2.3 Admin

Admin is the one who is responsible for managing the "DOCUTRACKER" system and has all the access on the user's section, Admin manages users

and receiver, it has the control over users' data and other credentials of registered accounts.

3.4.3 Opening Environments

3.4.3.1 Software Components

The developers used "Visual studio code" for developing and designing the system. For the frontend, the developers used HTML, CSS and svelte.js library, we use several modules that comes alongside svelte to help in the overall development process of the frontend, in the backend the developers used python flask for database integration, data processing and other server side operations which exposes a rest API/endpoint which the frontend can grab into.

3.4.4 Design and Implementation Constraints

The major implementation constraint the comes along during the development process, due to the separation of concern of the front end and backend is CORS (Cross Origin Resource Sharing), CORS is a security feature in the browser, which no frontend code can access the backend endpoint which gives the developers a hard time getting around it.

3.4.5 Other Non-functional Requirements

The system comes with a range of Non-functional Requirements that is required and common in developing software such as Security, Usability

and Availability, etc. These system attributes makes DOCUTRACKER more reliable and capable that ensures safety at the same time

3.4.7.1 Safety requirements

DOCUTRACKER comes with common security features that can be found in most software such as real time validation of entries, password hashing, email verification, CORS (Cross Origin Resource Sharing) ensures that only our frontend can access the backend endpoint, DOCUTRACKER uses JWT (JSON Web Tokens) to authenticate the user, admin also verifies the user accounts, etc. DOCUTRACKER ensures that the users and data are safe under its supervision.

3.4.7.2 Security Requirements

In order to maintain the security of the system, DOCUTRACKER is supervised by the admin which has control over the users which is called administrative Security, after users creating/signing up their account, the admin needs to verify the newly registered account first. When the user logs in for the first time and if their account is still under verification by the admin, they can't use DOCUTRACKER which leaves them to patiently wait until their account is verified, admin also supervised users in real time this ensures that DOCUTRACKER is secure.

3.4.6 Software Quality Requirements

The DOCUTRACKER: A Web Based Document Management Information System for Davao Oriental offers the following features that indicate high software quality:

3.4.8.1 Usability

The developers will implement a user-centered design which provides the user-friendly interface that allows users and receivers to effortlessly interact within the system. The system's well-organized and visually appealing design enhances the user experience.

3.4.8.2 Reliability

The system is properly tested by the developers in the time of development before being implemented. It places on dependability through rigorous testing, quality assurance measures, robust error-handling and data integrity that assure constant performance and good process flow of tracking documents.

3.4.8.3 Functionality

DOCUTRACKER is a pioneering solution that revolutionizes the way organizations manage and track their physical documents. Unlike traditional paper-based systems that are prone to misplacement, loss, and inefficiency, your system introduces a recommended approach to document management with the precision and efficiency of digital tracking.

At its core, the system is designed to eliminate the bulk and heft of paper documents, making records easier to track and share. It addresses the critical need for updated backup copies of important documents. By digitizing the tracking process, the system ensures that every document is accounted for, reducing the risk of misplacement and enhancing the overall workflow of documents.

Moreover, the system provides detailed tracking information for each document, including actions taken, view document data offline, notifying etc. This level of detail is crucial for maintaining compliance with regulatory standards. By providing a comprehensive view of document activity, the system empowers DOrSU to make informed decisions about document retention and disposal.

3.4.8.4 Portability

The system can be utilized across a broad spectrum of internet-connected devices, encompassing desktops, laptops, and tablets, offering flexibility and convenience for users regardless of their location. This inclusivity ensures that whether you're working from a stationary desktop setup, a portable laptop, or a versatile tablet, the system remains accessible and functional. However, it's important to note that while the system is designed for portability and ease of use across different devices, it may not be optimized for mobile phones due to the unique challenges and constraints associated with mobile platforms.

3.4.8.5 Maintainability

DOCUTRACKER architecture is meticulously designed to ensure high levels of maintainability, leveraging modern development practices and architectural patterns. By utilizing Svelte for the frontend, you benefit from a component-based approach that significantly enhances code organization and reusability. This component tree structure not only makes the codebase easier to navigate and understand but also promotes the reuse of components across different parts of the application, reducing redundancy and simplifying maintenance efforts.

The adoption of a micro services architecture further bolsters maintainability. This approach allows for the separation of concerns, enabling the frontend and backend to evolve independently. Each service within the micro services architecture can be developed, deployed, and scaled according to its specific requirements, without affecting the overall application. This modularity is crucial for maintaining the application's health and performance as it grows.

Moreover, the use of REST APIs in the backend streamlines the management of different services. RESTful services facilitate seamless communication between various components of the system, making it easier to introduce new features or update existing ones without the need for extensive modifications to the backend codebase. This modular approach to backend development simplifies maintenance tasks, as changes can be isolated to specific services, minimizing the impact on the entire system.

3.4.8.6 Efficiency

The system lies in its ability to provide real-time visibility into the status of documents. The system keeps track of the activities, ensuring that documents are in sight. This real-time tracking capability is particularly beneficial for businesses that undergo regular audits, as it provides a clear and verifiable trail of document activity.

The system which follows security practices are another testament to its efficiency. By controlling access to documents and ensuring that only authorized users can view and accepts them, the system protects against unauthorized access. This level of security safeguards confidential information and data associated with the document.

3.5 Design

3.5.1 Use case Diagram

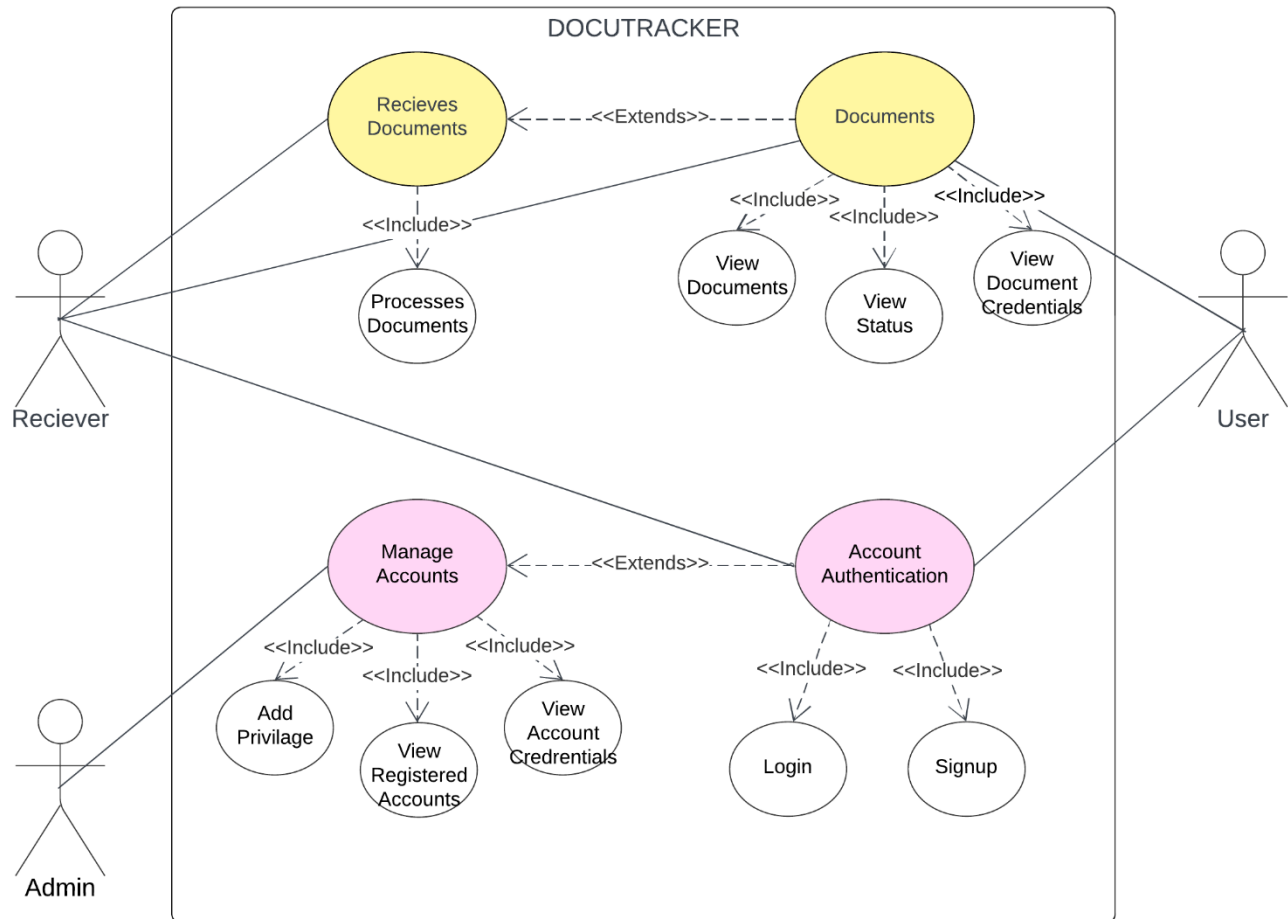


Figure 3.3: DOCUTRACKER Use Case Diagram

3.5.1.1 Use Case Description

The explanations of the Use Case Diagram that the developers were using were supplied in this, enabling the users to manage different aspects of the DOCUTRACKER: A Web Based Document Management System for Davao Oriental State University.

Table 3.1: Login

DOCUTRACKER: Login	
Actors	Admin/Users/Secretary
Description	Admin, registered user and secretary can log in their account by providing the account's credentials like username and password.
Data	Users/Secretary/Admins' username and password
Stimulus	By clicking the login button.
Response	The Dashboard page will appear.

Table 3.2: Register

DOCUTRACKER: Register	
Actors	User/Receiver
Description	Users and Receivers can create an account first by providing the necessary information and credentials before can get access to the system.
Data	User and secretary's credentials like name, address, email, password, etc.
Stimulus	By clicking the "Sign-up" button.
Response	The login page will appear.

Table 3.3: Add Document

DOCUTRACKER: Document Registration	
Actors	User
Description	The users can add document for the tracking process. Users are able to add not only one, but multiple of documents.
Data	User's full name, designation, id, name/type of document, description.
Stimulus	By clicking the "Add Document" in homepage
Response	The Add document page will appear.

Table 3.4: View Request Status

DOCUTRACKER: View Document Status	
Actors	Users
Description	The users can view the status of their requested document once they are done in adding document.
Data	User's information, document status
Stimulus	By clicking the "Expand dropdown" in homepage
Response	The Document Status page will expand.

Table 3.5: Manage Accounts

DOCUTRACKER: Manage Accounts	
Actors	Admin
Description	The admin is able to view the list of registered account and their information.
Data	List of registered user and receivers accounts

Stimulus	By clicking an account in admin homepage
Response	The “Manage account modal” page will appear.

Table 3.6: Document Approval

DOCUTRACKER: Document Approval	
Actors	Receiver
Description	The receiver’s role is to receive the document of users. Receiver can also dismiss the document if there’s a mistake or lacking of document attachment.
Data	Document credentials
Stimulus	By clicking the “Approve button” in Document modal.
Response	The “Document Approval” message will appear.

3.5.2 Entity Relationship Diagram

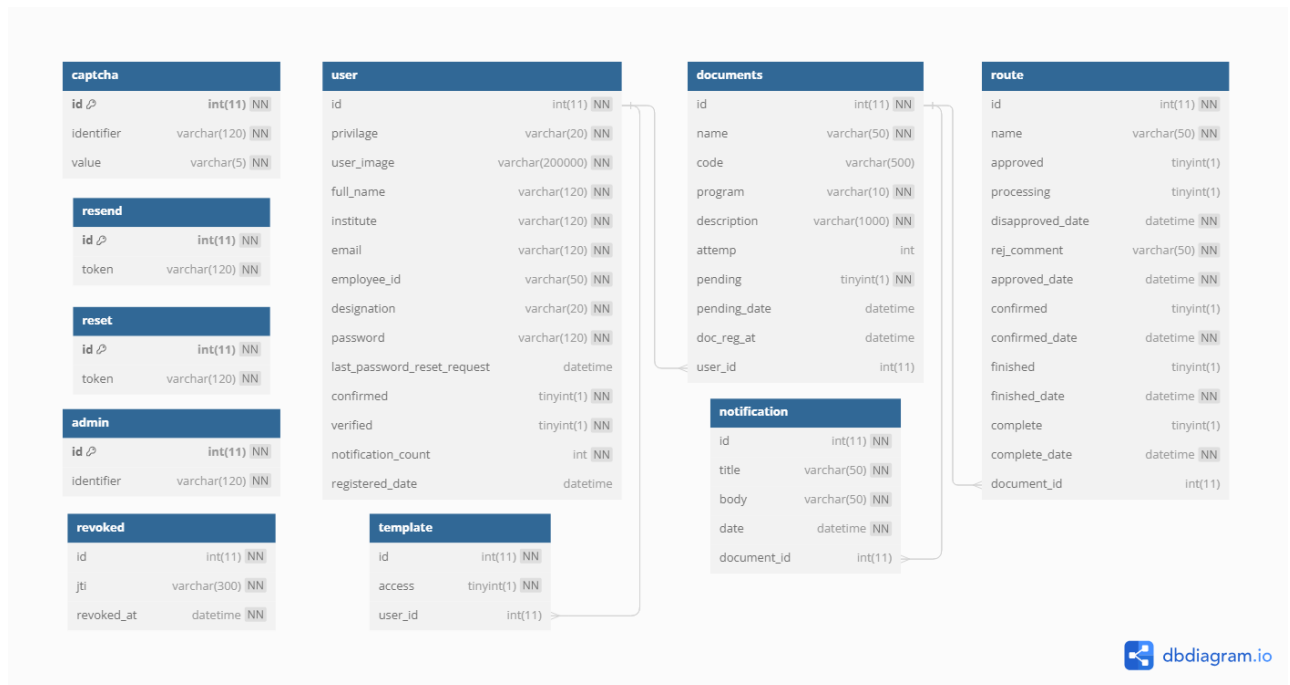


Figure 3.4: DOCUTRACKER Entity Relationship Diagram

3.5.3 Data Dictionary

Table Name	Attribute_Name	Type	Content	Format
Captcha	id	Int (11)	Captcha Id	PK, not null
	identifier	Varchar (120)	Captcha Identifier	Not null
	capt_value	Varchat (5)	Captcha value	Not null
Documents	docu_id	Int (11)	Id	PK, not null
	name	Varchar (50)	Document Name	Not null
	code	Varchar (50)	Document QR Code	Null
	program	Varchar (10)	Program Associated with the Document	Null
	description	Varchar (200)	Document Description	Null
	institute	Varchar(10)	Institute Associated with the Document	Null
	attemp	Int(11)	Document Resubmit attempts	[default: 0]
	pending	Tinyint(1)	Document Pending State	[default: true]

	pending_date	datetime	Document Registered Date	datetime
	user_id	Int(11)	User id	FK, Not null
Notifications	id	Int (11)	Notification id	PK, not null
	title	Varchar (50)	Notification Title	Not null
	body	Varchar(50)	Notification Content	Not null
	date	datetime	Notification Date	Not null
	document_id	Int(11)	Document Id	FK, not null
Resend	id	Int (11)	Resend Id	PK, not null
	token	Varchar (120)	Token	Not null
Reset	id	Int (11)	Reset Id	PK, not null (000)
	token	Varchar (120)	Reset Token	Not null
Revoked	id	Int (11)	Id	Not null
	jti	Varchar (50)	Revoked Token Value	Not null
	revoked_at	datetime	Revoke time	Not null
Route	id	Int (11)	Route Id	PK, not null
	name	Varchar (50)	Name	Not null
	approved	Tinyint (1)	Approved State	[default: 0]
	disapproved_date	datetime	Disapprove	Null

			Date	
	rej_comment	Varchar (50)	Comment of rejection	Null
	approved_date	datetime	Approve Date	Null
	confirmed	Tinyint (1)	Confirmed State	[default: 0]
	confirmed_date	datetime	Confirmed Date	Null
	finished	Tinyint(1)	Finished State	[default: 0]
	finished_date	datetime	Finished Date	null
	complete	Tinyint(1)	Complete State	[default: 0]
	complete_date	datetime	Complete Date	null
	document_id	Int (11)	Document Id	FK, not null
Template	id	Int (11)	Template Id	Not null
	access	Tinyint (1)	Access State	Not null
	user_id	Int (11)	User id	FK, not null
User	id	Int(11)	User Id	PK, Not null
	privilage	Varchar (20)	User privilage	Not null
	user_img	Varchar (120)	User Image	Not null
	full_name	Varchar (50)	User full name	Not null
	institute	Varchar (120)	User Institute	Not null
	email	Varchar (120)	User Email	Not null
	Employee_id	Varchar (50)	User Employee	Not null

			Id	
	designation	Varchar (20)	User Designation	Not null
	program	Varchar (20)	User Program	Not null
	password	Varchar (120)	User password	Not null
	last_password_reset _request	datetime	Last request date	[default: null]
	confirmed	Tinyint(0)	User confirmed State	[default: 0]
	verified	Tinyint(0)	User verified State	[default: 0]
	notification_count	Int (11)	Notification Count	Not null
	registered_date	datetime	User Registered Date	Not null

Table 3.7: Data Dictionary

3.5.4 Graphical User Interface Design

This would display a potential mock-up of the web-based application that the developers intended to create.

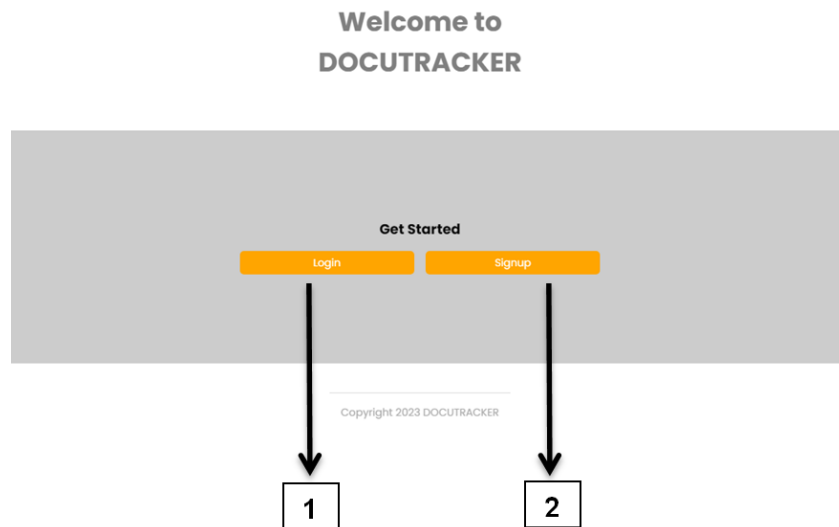


Figure 3.5: User and Secretary interface of DOCUTRACKER

Name	Function
1. Login button	Allows the user to access the login form.
2.	
3. Reister button	Allows the user to access the signup form.

Table 3.8: Overview Function Definition

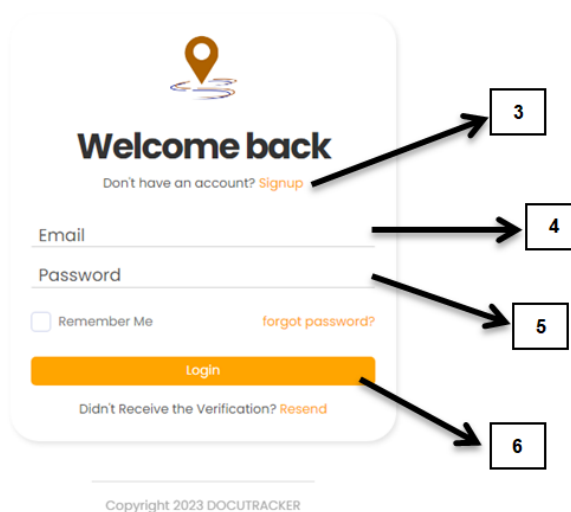



Figure 3.6: Login Form



Name	Functions
4. Signup hyperlink	Directs the user to access the signup form
5. Email	Allows the user/secretary to enter a email
6. Password	Allows the user/secretary to enter a password
7. Login Button	Directs the user/secretary to dashboard page

Table 3.9: Login Function Definition

Sign Up



Upload Your Profile

10

Email

Fullname Employee ID

Password Confirm Password

7

Designation Institute

8

☐ I am not a robot [forgot password?](#)

9

[Already have an Account? Login](#)

11

Figure 3.7: Sign up form

Name	Functions
8. Registration credentials	Allows the user to enter the credentials of account.
9. Dropdowns	Allows the user to select designation (Secretary, Faculty, Program Head, Dean Office, Academic VP, OP) and institute.
10. Captcha	Validates the user to if not a robot through captcha
11. Upload profile	Allows the user to upload his/her profile picture.
12. Submit button	Directs the user/receiver to login form.

Table 3.10: Signup Function Definition

User Interface



Figure 3.8: User Dashboard

Name	Functions
13. Sidebar Navigation	Contains a group of navigations
14. Add/Register Document	Directs the user to request document
15. Scan Document	Directs the user for scanning of documents.
16. Registration status	Provides information details for the status of document registration.
17. Registration status widget	Displays the quantity of registered document based on its status whether it is to be forwarded, approved, for waiting, complete, and rejected.
18. Document registration details	Displays the table list of registered documents which includes document name, description, ID, and registered date

Table 3.10: Dashboard Function Definition

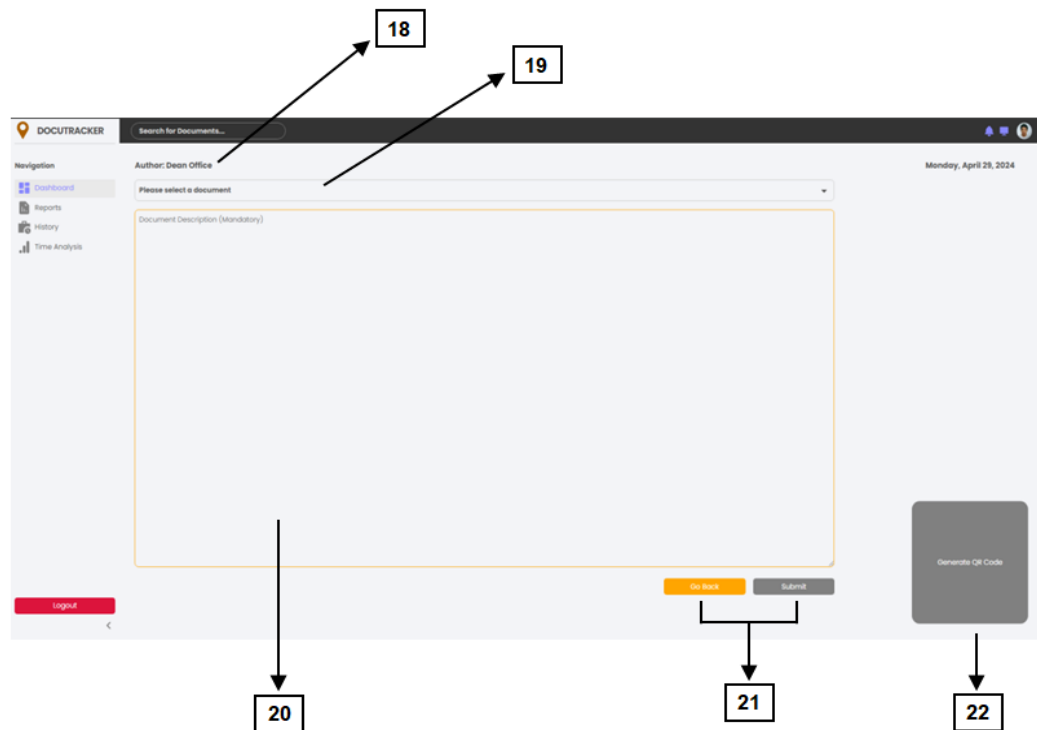


Figure 3.9: User Dashboard/Register Document

Name	Functions
19. Designation	Displays the work designation of the user
20. Select Document	Allows the user to select a document to be registered, Predefined or Custom
21. Document Description	User is required to include an description that is associated to the selected document
22. Back and Submit Button	Once the user is done, clicking submit will able to send his/her request to be processed. Pressing back button will directs back to dashboard.
23. Generate QR code	Allows the user to generate a QR code that will be used for the identification of selected document

Table 3.11: Document Registration Function Definition

Secretary Interface

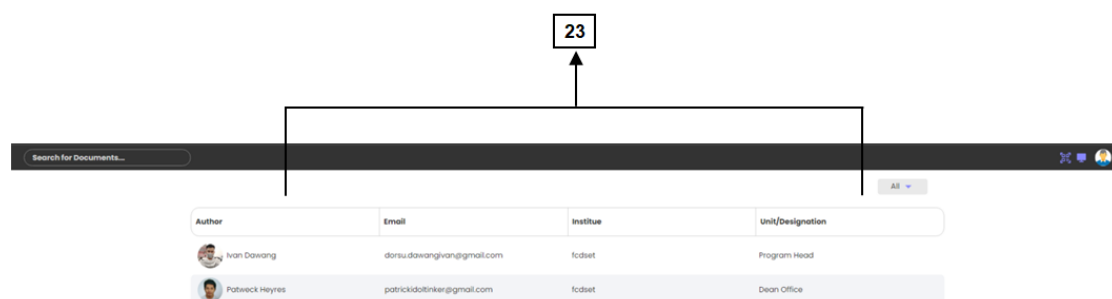


Figure 3.10: Secretary Dashboard

Name	Functions
24. User account details	Displays the table list of users who requests a document.

Table 3.12: Secretary Dashboard Function Definition

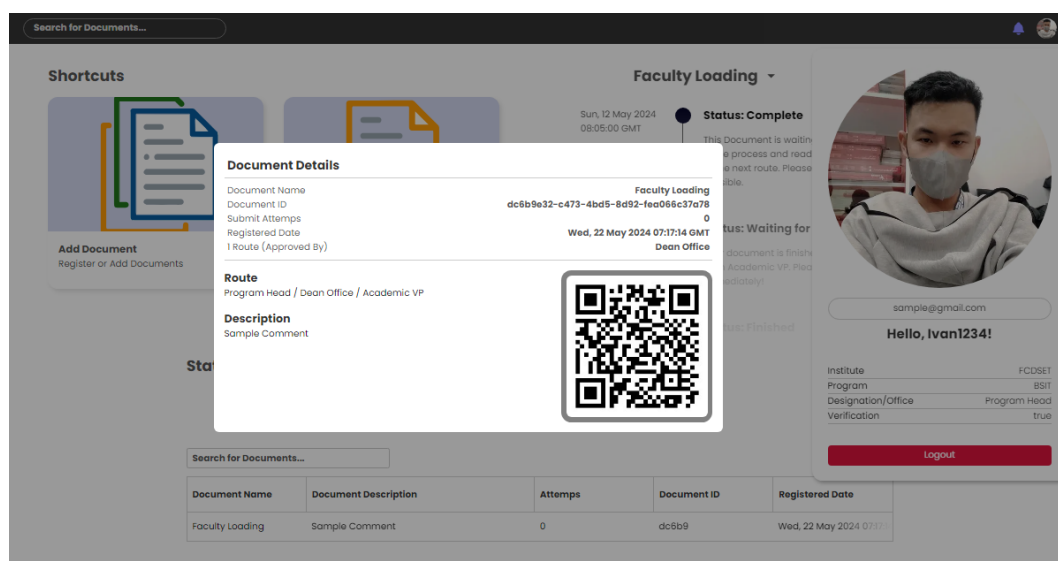


Figure 3.11: Document registration details

This figure shows the details of the registered document (once clicked the user's info shown in figure 3.11) that is made by the user. It contains the name, email, document name, ID, registered date, document description and its route.

Admin Interface

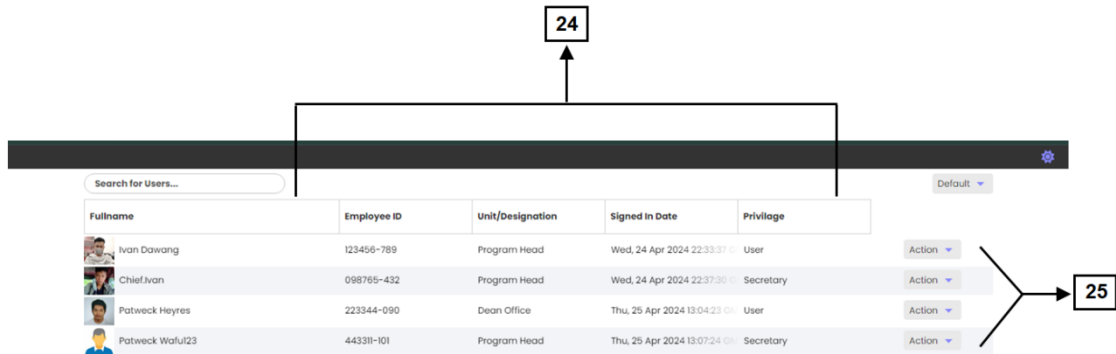


Figure 3.12: Admin Dashboard

Name	Functions
25. User account details	Displays the user's information and its privilege to the system.
26. Privilege selection	Allows the admin to set a privilege to the users after they've register account. Has two privilege which is user or document receiver.

Table 3.13: Admin Dashboard Function Definition

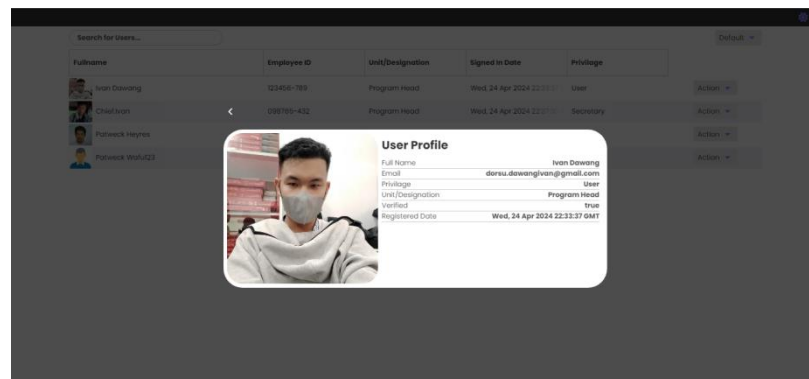


Figure 3.13: Admin Dashboard/User Profile

This figure shows the credentials of the user. It contains the name of the user, email, privilege to the system, designation, and date of registration.

3.6 Development and Testing

3.6.1 Development

During the DOCUTRACKER development phase, the developers used a combination of HTML/CSS, svelte and flask to create the user interface, creating an engaging and responsive design for the website. Front-end development was carried out utilizing these web technologies in order to provide consumers with a visually pleasing experience. The developers used PHP in combination with XAMPP as the server environment and MySQL as the database management system for the backend.

Visual Studio Code was the primary coding environment utilized throughout the development process. The compatibility, performance, and adaptability of these technologies influenced their selection, which contributed to the overall development of the DOCUTRACKER website.

3.6.2 Data Analysis plan

The DOCUTRACKER project, a web-based document tracker for Davao Oriental State University, will be reviewed in accordance with the ISO 25010:2011 standard to see if it fits the criteria. This assessment will be based on the evaluation of each user. DOCUTRACKER was evaluated using a questionnaire based on the ISO25010:2011 paradigm. Indicators for functional appropriateness, performance efficiency, usability, dependability, security, maintainability, and portability are included in the questionnaire.

The data will be analyzed using Weighted Arithmetic Mean for the evaluation. The respondents' answers on the survey may produce the Likert

scale. Each assessment item will be graded on a scale of 1 to 5, with 5 indicating strong agreement and 1 indicating strong disagreement. The weighted arithmetic mean will be obtained for each item, and the overall score of evaluation will be generated by averaging the responses of every item.

The weighted arithmetic mean will be interpreted using the scale below:

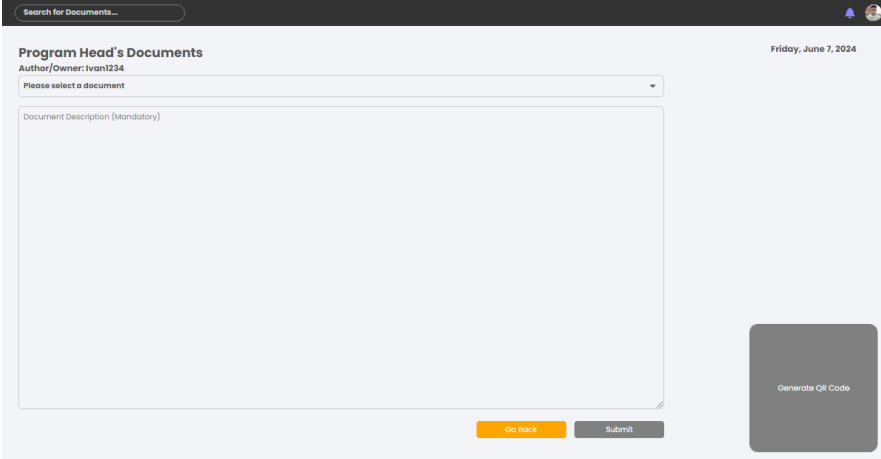
Weighted arithmetic mean range	Interpretation
4.50 – 5.0	Strongly Agree
3.50 – 4.50	Agree
2.50 – 3.50	Undecided/Fair
1.50 – 2.50	Disagree
1.50 and below	Strongly Disagree

CHAPTER IV

RESULTS AND DISCUSSION

4.1 Achievements per objective

The DOCUTRACKER successfully facilitates the registration of documents, incorporating a QR code generation feature. This function enables quick identification and easy retrieval of files, significantly reducing the time spent searching for documents. The QR codes serve as a unique identifier for each document, ensuring that they are easily trackable and minimizing the risk of misplacement.

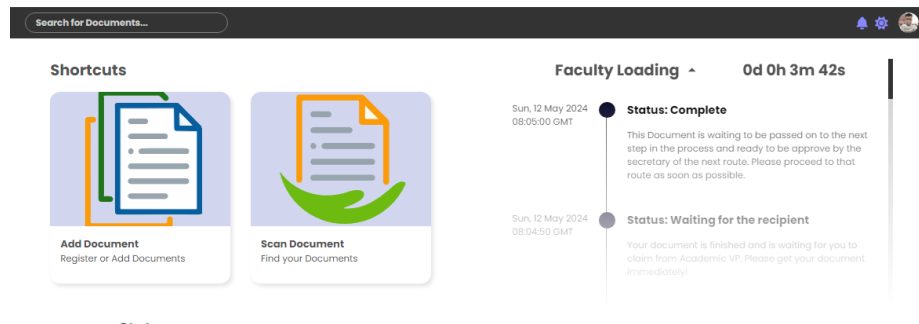


The screenshot displays the 'Program Head's Documents' registration page. At the top, there is a dark header with a search bar labeled 'Search for Documents...' and a user profile icon. Below the header, the page title 'Program Head's Documents' is shown, followed by the author information 'Author/Owner: Ivan1234' and the date 'Friday, June 7, 2024'. A dropdown menu labeled 'Please select a document' is present. The main content area features a large text box for 'Document Description (Mandatory)'. At the bottom of the form, there are two buttons: 'Go Back' (orange) and 'Submit' (grey). To the right of the form, there is a large grey button labeled 'Generate QR Code'.

The screenshot shows a web interface titled "Program Head's Documents" with a date of "Monday, June 10, 2024". The user is "Ivan Dawang". The interface includes a search bar, a dropdown for "Others: Please Specify!", a route selector showing "Program Head / Academic VP / OP /", and a mandatory document description field. A modal form is open with the document name "Sample Document" and a route selection dropdown. The modal has "Go Back" and "Submit" buttons. A summary section shows the selected route: "Program Head / Academic VP / OP". A "Generate QR Code" button is visible on the right.

Figure 4.1: Document Registration Interface

The system provides users with real-time updates on the status of documents throughout their lifecycle. Users can view the current status and the time taken at each stage of document processing, which helps in identifying bottlenecks and improving overall efficiency. The visual representation of the document's journey ensures that all stakeholders are aware of its progress, enhancing transparency and accountability within the organization.



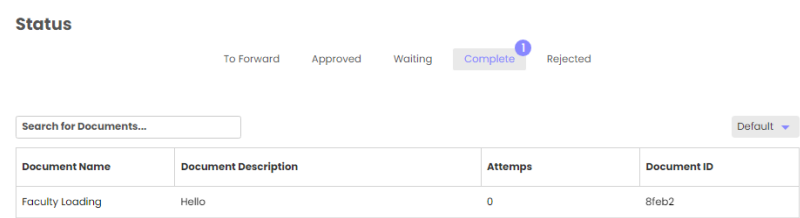


Figure 4.2: User Dashboard

DOCUTRACKER includes a comprehensive time analysis feature that breaks down the time spent on each stage of document processing. This analysis allows users to pinpoint areas where delays occur and implement strategies for improvement.

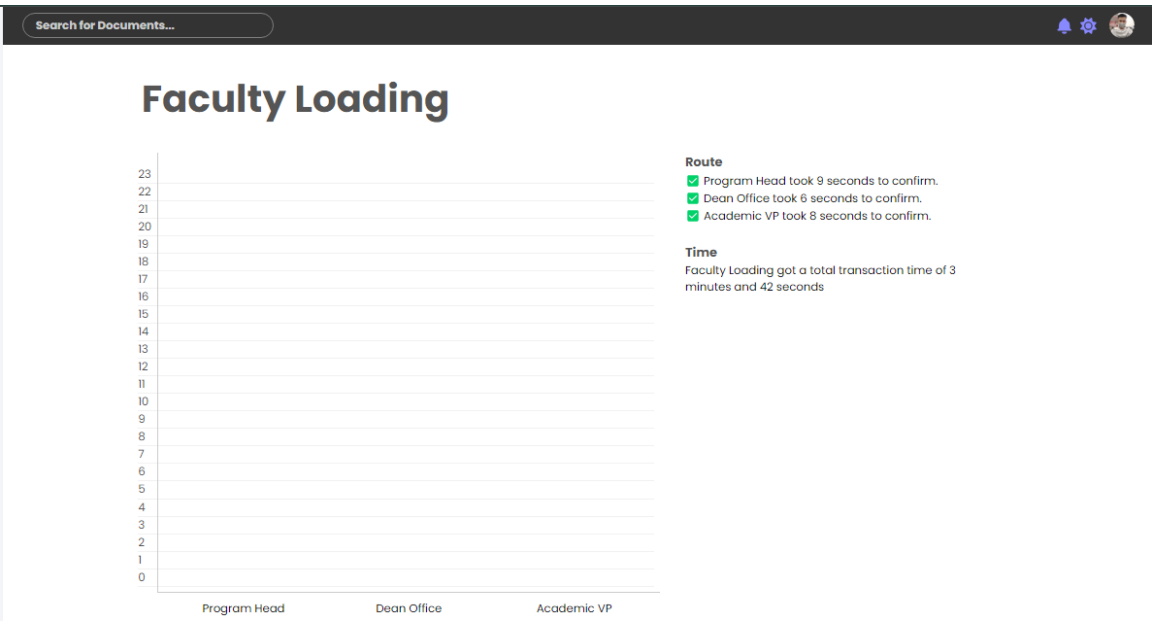


Figure 4.3: Time Analysis

Additionally, the system enables users to download a PDF file of the document's data for offline viewing, ensuring that information is accessible even without an internet connection. This feature is particularly useful for reporting and auditing purposes.

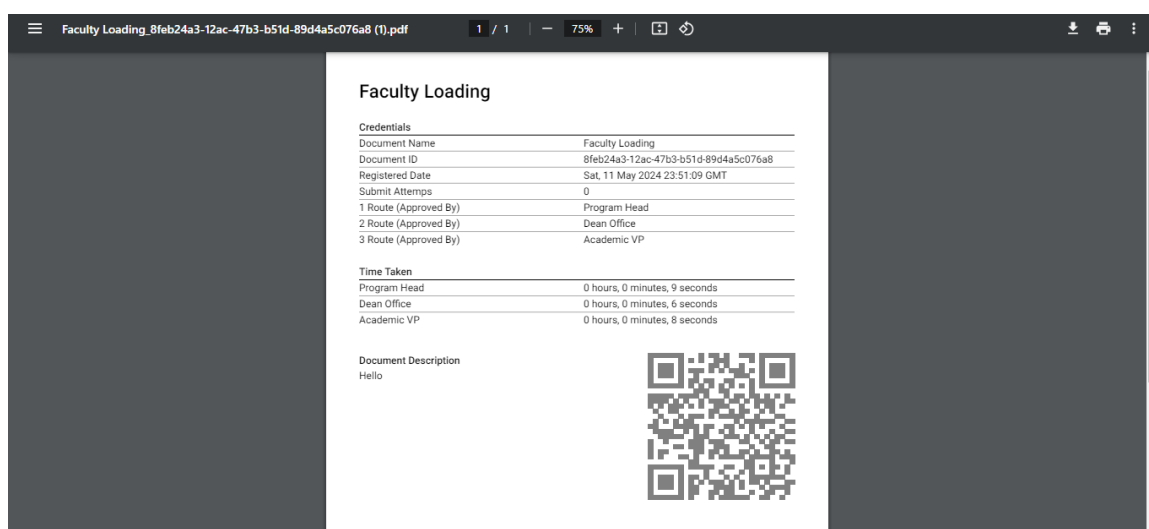


Figure 4.4: Offline Data

4.2 Implication and Result Discussion

The implementation of DOCUTRACKER has shown significant improvements in the management and organization of documents at Davao Oriental State University. By providing an intuitive interface and streamlining the document lifecycle from creation to retrieval, the system has enhanced operational efficiency. The platform's secure and accessible nature promotes a smooth flow of information between departments, thereby fostering a more responsive administrative process.

Furthermore, the system not only encourages transparency and accountability but also significantly reduces the time and effort required for document handling. This efficiency gain translates into better resource allocation and improved administrative services within the university. The implementation of DOCUTRACKER exemplifies how modern technology can be leveraged to address traditional challenges in document management, resulting in significant operational benefits for the institution.

4.3 Implementation Plan

In preparing for the rollout of the system, we have crafted a comprehensive implementation plan. This strategic blueprint is designed to ensure a smooth transition and successful adoption of the system across our target areas. Collaborating closely with key stakeholders, we aim to identify optimal sites and beneficiaries who will greatly benefit from this initiative. Our strategy is outlined in detail in Table 4.1, serving as a roadmap for the systematic deployment of our project.

STRATEGY	ACTIVITIES	PERSONS INVOLVED	DURATION
Approval From Users	Letter	Researcher, Users	1 Day
Deployment	Installation of the System's Dependencies and Libraries	Researchers	30 Minutes
Information Distribution	User Manual	Researcher, Users	1 Day

Table 4.1: Implementation Plan

CHAPTER V

SUMMARY, CONCLUSIONS AND RECCOMENDATIONS

5.1 Summary

Researchers developed, designed, and implemented a web based document management information system for Davao Oriental State University that is capable of adapting the manual processing method of documents within faculties in DOrSU in order to reduce given time and effort of those who process and manages the documents. The researchers gathered information of mainly processed document and its routes in order to be applied in the system. For the system development, the researchers developed a plan for design which focuses on user-friendly interface, and using some of programming language for the overall functionality of the system.

5.2 Conclusion

In conclusion, the developers of DOCUTRACKER, a web-based document management information system established at Davao Oriental State University, have provided an essential solution for managing and organizing the university's arrays of papers. This system features an easy-to-use interface that streamlines the document lifecycle, from creation to retrieval. DOCUTRACKER not only fosters transparency and accountability but also reduces the time and effort required to handle documents. Its secure and accessible platform ensures a smooth flow of information between departments, resulting in a more efficient and responsive administrative process for Davao Oriental State University.

5.3 Recommendation

In light of the evolving needs and challenges faced by Institution in managing document workflow efficiently, we propose a series of recommendations aimed at optimizing the current system. These improvements are designed to streamline processes, enhance accountability, and ensure inclusivity across different roles involved in document handling. By implementing these changes, we aim to foster a more transparent, secure, and effective document management environment.

- Re-design the system process flow in document tracking
- Include other person involved in document processing not only the secretary of the institute/office/unit.
- Demonstrate at least three document types that is being forwarded from & to (ex. Dean/ VPAA/ OP)
- There should be a mechanism to approved what user type/role should the user/s belongs.
- If the program head is the uploader, it should be approved by itself
- Include a faculty account
- Include who is the Sender of the document in the document Registration Page

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APPENDICES