DOCUTRACKER: A Web Based Document Management Information System For Davao Oriental State University

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DOCUTRACKER: A Web Based Document Management Information System For Davao Oriental State University

In today's business environment, one of the most prevalent challenges faced by organizations is the loss of physical documents. It's estimated that 75% of all 12 corporate documents are misplaced and remain undiscovered. The time and resources spent on searching for lost documents and the cost of replacing them can be significant. Document loss can lead to wasted time and resources, as well as potential legal and financial implications (Bentech, 2022). This issue is also relevant to Davao Oriental State University (DORSU).

Not having a document management system can make it challenging to find documents and understand their status. This may result in wasted time and effort as employees spend hours sifting through physical files only to discover that the document is missing or overlooked. Additionally, the lack of clarity in document status can lead to potential errors in document approval, as stakeholders may not have access to the most up-to-date version or may be unaware of changes made to the document. Furthermore, the absence of a document tracking system can contribute to compliance issues due to missing or outdated documents, potentially leading to fines, penalties, or legal action. For organizations subject to strict regulatory requirements or industry standards, accurate and timely document management is essential for compliance and avoiding legal consequences.

DOCUTRACKER is an advanced web-based document tracking system that provides DORSU with a seamless tracking solution. This innovative system has the potential to significantly reduce the time and effort involved in locating documents, as well as ensuring awareness of their whereabouts, and guaranteeing efficient and secure tracking. By implementing a document tracking system like DOCUTRACKER, businesses can experience improved efficiency, enhanced security, and a reduction in errors and misplaced documents. Ultimately, this can lead to better collaboration and streamlined document routing, resulting in cost savings (Q. Techopedia, n.d. 2019).

A recent global study on document tracking highlights Publuu Interactive Online Flipbook. Publuu is a cloud-based platform designed for modern businesses, allowing them to create, organize, and monitor all their business documents in one place using Flipbook PDFs. It stands out as a real-time document tracking system that allows users to share multiple trackable links for each recipient or group they want to monitor. This feature sets Publuu apart from other document-tracking technologies currently available (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. It enhances document tracking and makes 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).

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 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.

This paper seeks to create a web-based platform document information management system to prevent document loss and streamline document processing. The collected data will provide valuable insights into the challenges, issues, and their solutions, serving as a resource for future

researchers to enhance their understanding, expand their knowledge, and develop more effective solutions for the benefit of all.

To develop the DOCUTRACKER system, a Web-Based Document Management Information System for Davao Oriental State University, the researchers have identified the programming languages and libraries that will be utilized, as outlined below:

Svelte is an innovative tool for creating interactive User Interfaces (UI). Unlike traditional JavaScript libraries that perform most of their work in the browser, Svelte moves this process into a compilation step that occurs during app building. This leads to highly efficient code that updates the Document Object Model (DOM) with incredible speed. Svelte functions as a compiler, so it's not as simple as adding a script tag to your page and importing it into your app. You'll need to configure your development environment to allow the compiler to perform its tasks. Components serve as the foundational elements of Svelte applications. They are authored in .svelte files using an extended version of HTML. The Svelte compiler transforms your components into JavaScript to render the HTML for the page and into CSS to style the page.

In DOCUTRACKER, Svelte is the chosen tool for developing the application's user interface. Svelte is a front-end library specifically designed for creating interactive user interfaces that run in a web browser. Unlike other libraries, Svelte does not rely on a virtual DOM. Instead, it compiles code into optimized vanilla JavaScript, which reduces runtime overhead and enhances 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.

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.

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. The 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.

The research paper titled "A Data Centre Configurable Data Mining Document Management Information System, 2021" by Gurusubramani, S., Mouleeswaran, S. K., Srinivas, P., & Aruna, R., highlights the rapid growth of electronic information across various human activities, including research and industry, over the past two years. The paper emphasizes the generation of large data sets from cameras, instruments, handheld devices, and computers, necessitating efficient technologies for flexible data collection workflows, particularly through cloud-based storage platforms. It delves into the implementation of cloud infrastructure to create an optimized framework for scalable data analysis workflows. The authors explain the construction and application of the Data Mining Cloud Architecture, along with a data analytics method that integrates visual workflow vocabulary within a Virtualized environment. The DMCF (Data Mining Cloud Framework) aims to streamline the development of data mining applications by integrating them with generic

system monitoring schemes, offering a solution tailored to actual data mining requirements.

The research paper titled "Electronic Document Management Information System for Universities, 2018" authored by Costoiu M., Plesu V., Isopescu R., Soriga S., Alesincu S., Arsene I., underscores the importance of efficient fund administration and cohesive coordination of various activities in the management of Higher Education institutions. This study highlights the continuous improvement of the electronic document management information system within the University, aiming to provide an effective management tool. A comprehensive assessment was conducted to address the myriad documents circulating within the University and the challenges associated with the digitization of certain essential documents. Additionally, the authors noted that the document management system allows for document creation by authors, as well as document input through scanning, automatic import from file systems or other applications, via email, or automatic generation based on forms.

The study titled "Interrelationship between document management, information management, and knowledge management, 2017" by N. Sewdass asserts that documents are naturally produced as a result of organizational activities. Information and knowledge are considered crucial assets for organizations. Effectively managing documents, information, and knowledge can enhance business efficiency and effectiveness, contributing to organizational competitiveness. These three concepts—document management, information management, and knowledge management—are increasingly prominent in academic and vocational literature. Despite the

frequent use and discussion of these concepts, there is still ambiguity, confusion, and little consensus on how to execute them.

The study "System Development for Document Management System, 2018," authored by Kiplie, Yatin, Angutim, and Hamid, emphasizes that digitization systems should consistently facilitate the sharing and movement of data from other systems, irrespective of the chosen integration level. System development entails a formal series of processes to define, design, test, and implement new software applications or programs, including customizing systems internally and creating database systems. A digitization system enables organizations to capture crucial materials that can be leveraged as valuable information and knowledge for business, academic, or research purposes. According to Kroenke (2015), an information system is an organized framework for collecting, organizing, storing, and communicating information. Specifically, it involves a network of connected individuals and organizations that gather, filter, process, create, and distribute data to specific users. Therefore, an information system can be defined as a set of interconnected components working together to generate, present, and disseminate information.

The study titled "Electronic Document Management System: Malaysian Experience, 2021" by Yatin, S. F. M., Ramli, A. A. M., Shuhaimi, H., & Kadir, M. R. A., discusses the long-advertised benefits of document management systems in solving paper-related issues. These systems offer the potential to tightly control the handling of paper documents and are sometimes referred to as "enterprise or electronic document management systems." It's crucial to understand that these systems manage documents, not the information or

knowledge within them. Therefore, their impact on a business lies in the efficiency they provide in document storage, retrieval, and information access.

The study also highlights the increasing acquisition of computers for record keeping as the awareness of computers as a tool for data processing grew. An initiative in Vision 2020 focuses on record keeping and document management, specifically the Generic Office Environment-Electronic Government Document Management System (GOE-EGDMS). The study aims to evaluate the usage and effectiveness of the GOE-EGDMS implementation using the IS Effectiveness Model from DeLone and McLean.

Please take note of the following text:

"A study titled "eGovernment Document Management System: A Case Analysis of Risk and Reward, 2016" by Jones, S, emphasizes the significance of deploying an electronic document management system (EDMS) to establish a virtual workplace environment and enhance the capabilities of a modern organization and its workforce (Adam, 2007). The study points out that EDMS can empower users to streamline business processes through workflow and information sharing, ultimately improving information management (Hammer & Hershman, 2010). Additionally, Read (2009) underscores that using IT in back-office functions can significantly enhance operational efficiency, particularly with EDMS implementations (Wilkins, Swatman, & Holt, 2009). There is also a growing acknowledgment that common IT systems and business processes in the public sector can lead to efficiencies (Gershon, 2004). As the public sector increasingly adopts technology and seeks to be more innovative, organizations are turning to IT systems to transform service delivery both internally and

externally. This case analysis delves into the initiation and implementation of the EDMS and leverages literature and case study findings to propose a framework for assessing the value, benefits, and risks of an electronic document management system, ensuring that it aligns with desired outcomes."

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.

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 identify the university's specific requirements and challenges in document management.

This system, namely "DOCUTRACKER" will be built with Svelte and Flask, which 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.

The system is built using the Agile methodology, a collaborative and iterative approach to software development that emphasizes user input, cooperation, and continual improvement. Although initially designed for software

development, the concepts of Agile are now employed across various disciplines and sectors. Key concepts include incremental delivery, cross-functional teams, face-to-face communication, functional software over documentation, self-organizing teams, regular reflection and improvement, and transparency.

Incorporating the Agile methodology into DOCUTRACKER can lead to enhanced transparency, swifter value delivery, increased user satisfaction, and the ability to efficiently adapt to changing requirements. Agile methodology provides a structured approach to developing efficient and adaptable tracking management systems by embracing iterative development, visual tracking, continuous feedback, and empowered teams.

Requirements:

In this process, the researchers built a plan for 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 wireframing 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 has 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 of the system. It will also be based on the feedback of the users.

3.2   Requirements Analysis

The researchers analyzed the requirements and information needed to ensure that the system would work perfectly to provide services to the users and ensure the user-friendly interface of the system. 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.

3.2.1   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 that provides a 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 at 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, viewing 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 front end, 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 microservices architecture further bolsters maintainability. This approach allows for the separation of concerns, enabling the front end and back end to evolve independently. Each service within the microservices 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 is another testament to its efficiency. By controlling access to documents and ensuring that only authorized users can view and accept them, the system protects against unauthorized access. This level of security safeguards confidential information and data associated with the document.

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.

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 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.

The DOCUTRACKER project, a web-based document tracker for Davao Oriental State University, will be reviewed by 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 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 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.

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.

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.

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.

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.

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 to reduce given time and effort of those who process and manage the documents. The researchers gathered information on mainly processed documents and their routes to be applied in the system. For the system development, the researchers developed a design plan that focuses on a user-friendly interface and uses some programming language for the overall functionality of the system.

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.