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WEB-BASED ELECTRONIC DOCUMENT TRACKING MANAGEMENT SYSTEM

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Abstract. Department of Social Welfare and Development Field Office V existing document transactions tracking process is still manually done through manual encoding using the log-book for tracking the document. With rapidly-changing technology and increasing emphasis in managing information properly, the researcher developed a more stable and more efficient Web-Based Electronic Document Tracking Management System. The proposed system is the perfect solution for the problems arising in the office. It refers to the professional practice of managing the documents of an organization. This includes identifying, classifying, storing, securing, retrieving, tracking and preserving documents. Improving of the system in the office is a key that facilitates effective communications between client and staff whilst also providing opportunities for making the system more flexible and efficient. It enhances the tracking of documents, and makes the information more effortlessly accessible. The findings of the study depict that the system is applicable to the DSWD Field Office V, Center / Institutions and at the six (6) Provincial Operations Offices (POOs), having an overall mean of 4.257. The components of the system are fully functional and are deemed to be essential to the entire operation of the system. The system was evaluated against its functionality, reliability, usability, efficiency, maintainability and portability. Along with the positive findings of the study, the developer deems it necessary to implement the developed system to help the DSWD Field Office V to monitor and manage the documents. The Researchers believe that a well-managed Electronic Document Tracking Management System can improve the processes of DSWD FOV.

Key Words: Document Management, Docu-Track, Electronic Tracking System, Tracking System, Web Tracking System

INTRODUCTION

Globalization has grown vastly and workplaces had been more physically dispersed. Storage prices were falling despite increasing capacity. This means that document production had increased rapidly and was used more than ever in several places. One tree yields 8,333 sheets of paper, that's 768 million trees to produce world's annual paper supply and each office worker prints 1,000 pages per month but 45% of documents are thrown out within 24 hours (Schoen, 2016). Probably one of the best definitions of a document is proposed by Andrea Wharton, who describes it as simply a "container for information". Its format could be visual or audio and its media could be paper, electronic file or multimedia (Smith, 1998). Documents are very important in any aspect as this is the lifeblood of every institution. Often these documents are the reason why such institution exists merely because this represents their work product or its importance to perform everything that the work requires.

Today managing files in hard copy and searching them from bundles is a very tedious and big task, causing tremendous confusion and pressure on the administrative body of the institutes. Movement of such files from one desk to another takes time and slow down the process. Each month and year, innumerable files are created and need to be maintained for future reference. Even managing a physical rack structure requires efforts, space and time. The institutes need to provide extra facilities like storerooms to safeguard those files. All this leads to difficulties in - physically searching through piles of folders upon requirement, maintenance and careful arrangement of folders in racks, protection against book lice or bugs. In case of confidential documents, consequences of inefficiently handling them can range from falling prey to loss of valuable data, lost revenue or authority, data privacy infringement, etc. (Singh, 2019)

In connection to the challenges encountered by many organizations with manual managing files, this study proposed the development of a Web-based DSWD Electronic Document Tracking Management System. This system is a web based application system which tracks movements of the entire documents in all offices at the Regional Office V, Centers/ Institutions and at the six (6) Provincial Operations. Offices (POOs). A hierarchy of the employee has been maintained in this system. This system is capable of tracking the paper trail of documents created in all offices at the Regional Office V, Centers/ Institutions and at the six (6) Provincial Operations Offices (POOs). The EDTMS includes information on the originating and receiving office and personnel, as well as the time elapsed between offices/units/departments. In this information system, document attachments, revisions, updates, and remarks are also supported. Documents are easily tracked. You can check the paper trail and history of the old documents processed. The systems can also generate barcode for each transaction documents through the aid of barcode scanner. It has also

the capacity to trace the ageing of transaction per office, with tracking document history, thus each end-user can easily locate and determine status of documents from their end.

The E-Government Master Plan (EGMP) is a blueprint for the integration of ICTs for the whole of government. It builds on past plans while incorporating current aspirations to create a vision for the future. The plan recognizes that the issue of interoperability and harmonization is not solely a technical problem, but also includes many organizational concerns that need to be overcome. As such, the plan also describes the systems of governance (e.g. institutions, agencies, processes, resources and policies) that need to be strengthened to make its implementation possible and sustainable. (DICT, 2019)

The Department of Social Welfare and Development continue to support the E-Government Master Plan as innovations in line with the ICT services that provide transparent services to the client. The need to keep track and monitor documents have become significantly important today particularly in DSWD. The existing document transactions tracking process is still manually done through manual encoding using the log-book for tracking the document. Locating files is one of the greatest problems in the office. Time is wasted in archiving or searching files, energy is wasted chasing misplaced files, deadlines are missed and sometimes files are lost. The offices greatly rely on log-books of documents for their tracking and retrieval of information.

Document Tracking Management System is the perfect solution for the problems arising in the office. It refers to the professional practice of managing the documents of an organization. This includes identifying, classifying, storing, securing, retrieving, tracking and preserving documents. Improving of the system in the office is a key that facilitates effective communications between client and staff whilst also providing opportunities for making the system more flexible and efficient. It enhances the tracking of documents, and makes the information more effortlessly accessible.

The Researcher proposed to develop a Web-based Electronic Document Tracking Management System with barcode scanner, email and SMS support for Department of Social Welfare and Development Field Office V. It was proposed to enable the fast tracking of lost document, fast retrieval of lost document, reduce the amount of paper used, and to store large amount of data and information occupying a small office. Some benefits of the system are to provide enhanced computer-based information and tracking system with more features for the current file system, to lessen the manual processes, to improve the system, and to make the system store and generate efficient report. With such findings, the researcher believes that a well-managed Electronic Document Tracking Management System can improve the processes of DSWD FOV. This study aims to improve the office's transactions for a faster and efficient service. Furthermore, the system will be designed to meet client's expectations through eliminating most problems that the office faces.

Electronic Document Tracking Management System is a web application that reduce lost and misfiled documents, provide faster search and retrieval of documents, reduce the amount of physical space used to store documents, such as (file cabinets, boxes and shelving), hard copies of existing documents converted to e-copies. It also streamlines information and workflow, allow instant access to documents, implement with integrity, availability and auditable information system, staff improvement. It further provides easy file tracking where less energy is used, and

reduces the time spent doing so. It also manages all the document movement at any time from one staff/office to another one and help in managing the flow of document efficiently. Any staff/office can receive and forward document and decisions at any time. This system capable of tracking the paper trail of documents created in all offices at the Regional Office V, Center / Institutions and at the six (6) Provincial Operations Offices (POOs).

Each department must have a user who will be responsible for that department. In the other hand, the administrator will also have the ability to add a user (Administrative Staff) who will play the role of the Secretariat of each office/unit/department. All users will have the ability to create a document and upload the supporting documents and send them to the ones responsible for confirmation. When the file is sent to the responsible person, they will have a section of newly arrived documents and an action to accept using a barcode scanner or reject the file. If a file is rejected, it will require writing a reason for rejection and it will automatically return back to the one who sent it. If the file is accepted it will move to the accepted documents section "forward", "send for archiving"," print", "download" and "edit" actions. When the "forward" button is pressed it will open a window where you will have your possible forward transactions. If the document is finished, the finished button should be pressed. Other than these the file is available for download and print. Notice also that document can be edited only if it accepted. Only administrator will have the ability to see the movement history of a document archive a file in the database (Server Room).

Specific Objectives

Specifically, the study aims to:

1. Design and develop a Web Based Electronic Document Tracking Management System with the following feature:
    - 1.1. Document Tracking Module;
        - 1.1.1. System which allows inter-agency and intra-agency routing and tracking of documents through its default workflows.
        - 1.1.2. System which includes a customizable document management workflow that adapts to the needs of government agencies.
        - 1.1.3. System which includes a collaboration tool that allows multiple users to work together in the tracking and managing of documents.
        - 1.1.4. System with full index search is integrated in the system for easy tracking of documents.
        - 1.1.5. System which users can append metadata to the documents for faster searching.
    - 1.2. Records Management Module;
        - 1.2.1. System which allows the users to upload electronic documents for filing and retrieval.
    - 1.3. Provision of Audit Trails Module;
        - 1.3.1. System that track who had access to documents and records and the actions taken on them.
        - 1.3.2. System for recovery of deleted records and
        - 1.3.3. System for tracer of previous users and authorized activity
    - 1.4. Security Management Module;

1.4.1. Single Sign on Interface
1.4.2. User defined and user group enabled security models
1.4.3. Permission management, temporary accounts, PKI enabled and Report and Audit trails.

1.5. SMS and Email supports;
1.5.1. Sends Status and tracking of documents.

2. To evaluate the system using ISO 9126 in terms of:
2.1. Functionality
2.2. Reliability
2.3. Usability
2.4. Efficiency
2.5. Maintainability
2.6. Portability

Development Time Frame

Time is vital in the development of the system because the programmer is a fulltime employee and at the same time doing the project. The developer really followed the Gantt chart in order to finish the project.

Table 3.4 – System Development Time Frame

Task	Aug				Sept				Oct				Nov				Dec			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Requirements Planning																				
Researching the current problem																				
Defining the requirement for the project																				
Finalizing the requirements with each stakeholder's approval																				
User Design																				
Prototype Iteration																				
Rapid Construction																				
Preparation for Rapid Construction																				
Program and application development																				
Coding																				
Unit, integration, and system testing																				
Cutover																				
Final debugging																				

Ready for launching																			

Table 3.4 showed the time frame of the study which was represented by the use of Gantt chart. It started from Requirements Planning to the Cutover which were the phases of the RAD methodology.

Phase 1: Requirements Planning

Requirements planning are the first phase of the development process. The researcher gathered all the necessary data to identify the existing problem and came up with a feasible and workable solution. The researcher prepared questionnaires and conducted interview to Department of Social Welfare and Development Field Office V in order to clearly understand the present flow of the document tracking operation and identify the existing problem encountered. The user/employees played a big part in the process of gathering data. They gave inputs and suggestion to the researcher that helped him develop the system that met their needs and requirements. The researcher also did an extensive browsing on the internet and research on the various websites to gather data that were significant to the study. All references, studies, articles and existing application provided by the internet were vital to the conducted study.

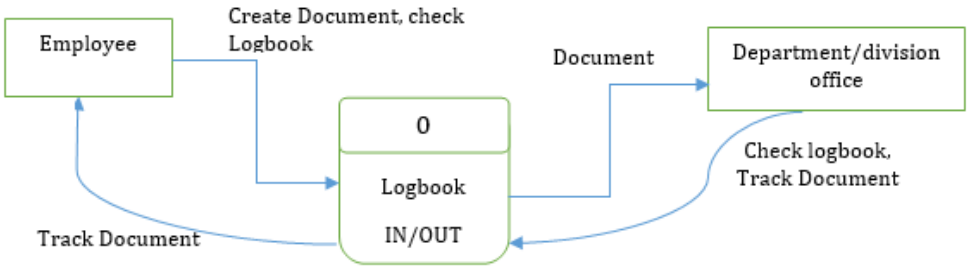


Figure 4.1 - Existing System DFD

Figure 4.1 showed the existing system diagram of Department of Social Welfare and Development Field Office V. The existing document transactions tracking process is manually done through manual encoding using the log-book for tracking the document.

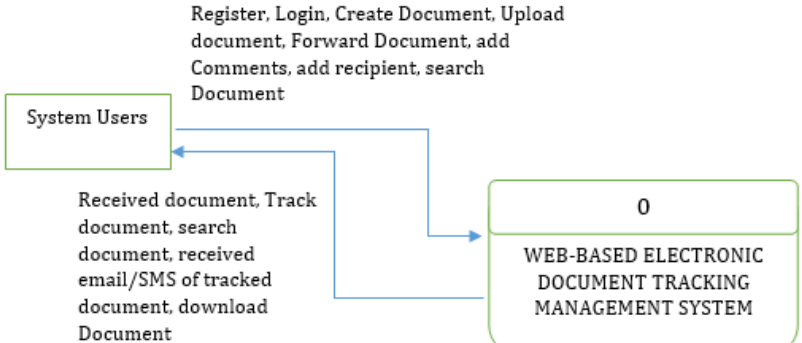
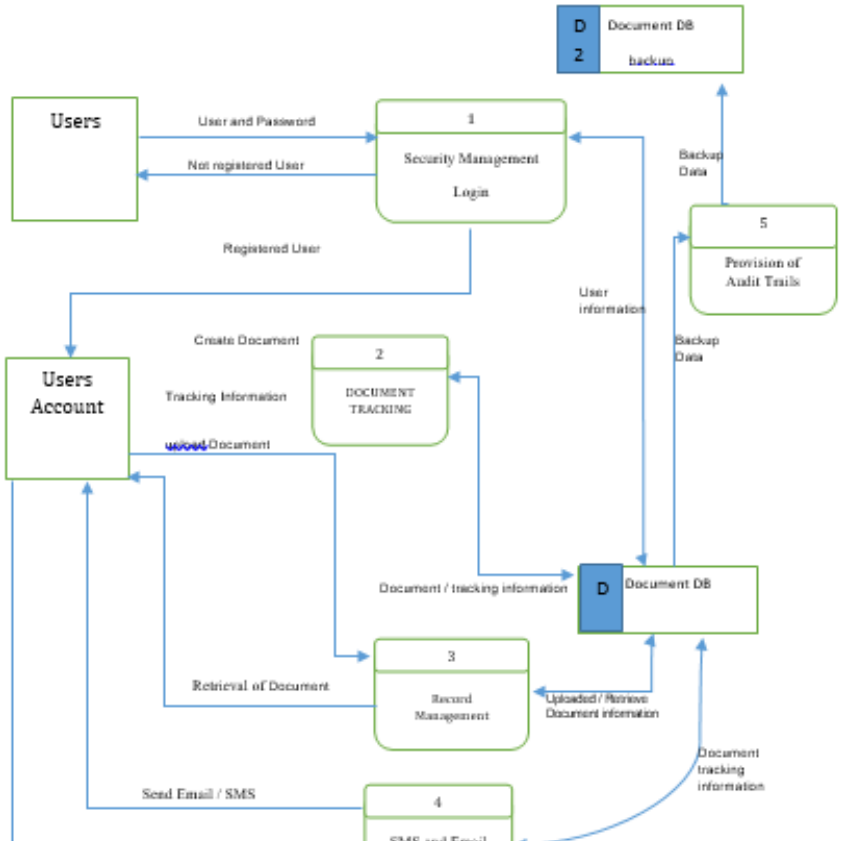


Figure 4.2 showed the context flow diagram of the proposed system. The system users were the DSWD FO5 employees, who were grouped depending on their Job descriptions.

The I.T. was considered as the system administrator and has a full access to all system modules. He is in charge of giving user access to a certain system module and performs timely backup for all files related to the system. He is also responsible for monitoring and documenting all system errors that might occur while the system is actively in production.

Users/employees are people who can create document to move from one desk to another among different section users. While creating a document, users can upload documents and select the desired receiver and submit it. A user receives the document using barcode scanner, check details and decide whether to Approved/Not Approved the document.

At this page, user can also download attached documents and view it. The user can also view all the tracking history of the document and on every movement user gets a notification via e-mail and SMS.



Phase 2: User Designs

Web-based Electronic Document Tracking Management System with barcode scanner, email and SMS support for Department of Social Welfare and Development Field Office V was developed. It was developed to enable the fast tracking, fast retrieval of lost document, reduce the amount of paper used, and to store large amount of data and information occupying a small office. Some benefits of the system were providing enhanced computer-based information and tracking system with more features for the current file system. The system also lessens the manual processes, it improved the existing system, and the system was able store and generates efficient reports.

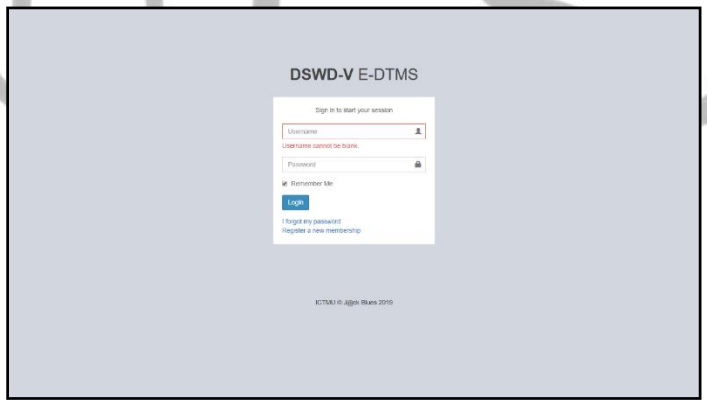


Figure 4.4 - User Login

Figure 4.4 displays the Log-in. It is the main defense of the system from any intruders or unauthorized users. This module requires a correct user name and password in order to access the main system.

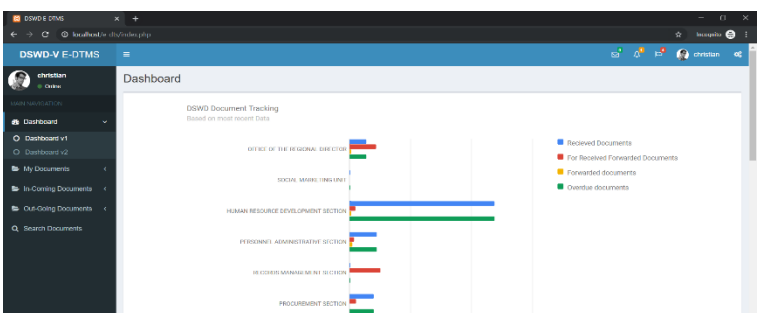


Figure 4.5 - Main Menu

Figure 4.4 reflects the Main Menu. It is the docking point of the user to access all the transaction that the system is capable. It contains a dashboard to monitor the number of documents.

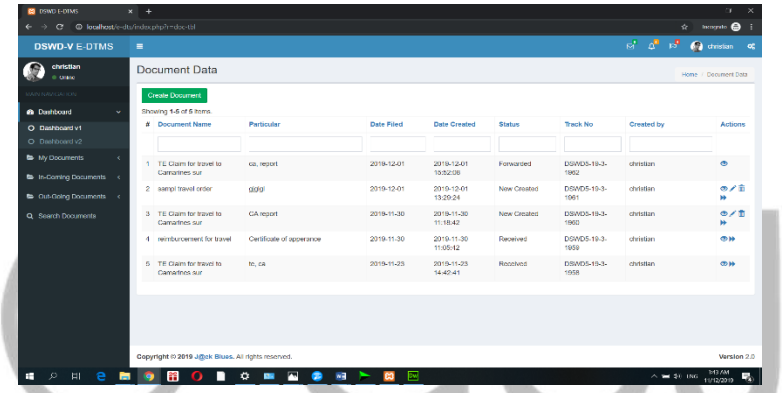


Figure 4.4 - User Login

Phase 3: Rapid Construction

In order to satisfy the stakeholders / users expectation the system needs to meet its objectives. Prototypes and beta system from the design phase were created and converted to working model that constructs the final working model. The third phase is important because the client still gets to give input through the process. They can suggest alterations changes, or even new ideas that can solve problems as they arise.

The system was evaluated by (10) ten IT expert and seven (7) stakeholders who were used of the system. The project has been evaluated on its: functionality, reliability, usability, efficiency, maintainability, and portability.

Frequency was used in order to determine the most dominant variable/s in the data, such as the current methods used. Ranking was used in order to determine the order of priority of the variables. The scaling system and weighted mean was used by the researcher as technique to monitor the evaluator's interpretation of facts.

Table 4.7 – Summary of the System Evaluation

Sections of Evaluation	IT Experts (10)	Users/ Stakeholders (7)	Mean	Interpretation
Functionality	4.200	4.361	4.28	Far more than what is expected
Reliability	4.082	4.429	4.26	Far more than what is expected
Usability	4.425	4.321	4.37	Far more than what is expected
Efficiency	4.200	4.071	4.14	Far more than what is expected

Table 4.7 shows the summary of the system evaluation of the different respondents. With an overall mean of 4.25666, the system was rated "far more than what is expected".

Phase 4: Cutover

This phase was the implementation stage of the project. The objective of this stage was to deliver a complete functioning and well documented system. The developed system was installed and deployed to the agency's server. Initial training was conducted after installation thus each module will still be subjected for re-evaluation and testing. The researcher will revise and send patches to the installed system if bugs occurred upon training.

Summary of Findings

The following findings were obtained from the study:

1. Department of Social Welfare and Development Field Office V existing document transactions tracking process is still manually done through manual encoding using the log-book for tracking the document. Locating files is one of the greatest problems in the office. Time is wasted in archiving or searching files, energy is wasted chasing misplaced files, deadlines are missed and sometimes files are lost. The offices greatly rely on log-books of documents for their tracking and retrieval of information.
2. To solve this problem of Department of Social Welfare and Development Field Office V, the researcher developed a more stable and more efficient Web-Based Electronic Document Tracking Management System. The proposed system is the perfect solution for the problems arising in the office. It refers to the professional practice of managing the documents of an organization. This includes identifying, classifying, storing, securing, retrieving, tracking and preserving documents. Improving of the system in the office is a key that facilitates effective communications between client and staff whilst also providing opportunities for making the system more flexible and efficient. It enhances the tracking of documents, and makes the information more effortlessly accessible.
3. The interviews conducted to the Department of Social Welfare and Development Field Office V, Center / Institutions and at the six (6) Provincial Operations Offices (POOs) became the primary source of information for the study to obtain valid and accurate date which are not found in books, magazines, journals, and others. On the other hand, secondary data were collected from printed materials like research studies related books and internet sources. The

study was conducted in a period of 4 months; from the planning of the system to design up to the finalizing of the paper and the program interface itself.

4. The developed system was evaluated in terms of its functionality, reliability, usability, efficiency, maintainability, and portability. It was evaluated by 17 respondents namely ten (10) IT experts and seven (7) users/stakeholders, having an overall mean of **4.26**.
5. All respondents were satisfied in how the developed system works. This proved that the system was effective and efficient to everyday task. With such findings, the Researchers believe that a well-managed Electronic Document Tracking Management System may improve the processes of DSWD FOV.

Conclusion

The conclusion drawn from the findings were the following:

1. The Web-Based Electronic Document Tracking Management System is more efficient and reliable compared to the old system.
2. The monitoring of document is made easier.
3. The graphic interface of the system is user friendly and its flow is easy to learn
4. The developed system eliminates most of manual process.
5. The system has no compatibility issue to most version of windows operating system.

Recommendation

To make the system achieve its full potential, the following recommendations are given:

1. DSWD FOV may utilized the developed system to improved and enhance the method of tracking and managing of documents.
2. This study is recommended for implementation since the developed system proves that it will be beneficial to all DSWD FOV employees.
3. To conduct training for users of the system and maintenance of the system.

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