UNIVERSITY OF DAR ES SALAAM



COLLEGE OF INFORMATION AND COMMUNICATION TECHNOLOGIES (COICT) DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

FINAL YEAR PROJECT REPORT 2020/2021 Project title: ELECTRONIC DOCUMENT TRACKING MANAGEMENT SYSTEM

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DECLARATION

Hereby **KIBAKA SIMTOVU MUSSA** with registration number 2018-04-10964 taking Bachelor of Science in Computer Science at the University of Dar es salaam I declare that, this report is my own work and has not been copied from any other student from University of Dar es salaam or other University and higher learning Institutions, otherwise no copy or party of this report will be produced without my written evidential document or **COLLEGE OF INFORMATION AND COMMUNICATION TECHNOLOGIES(COICT).**

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ABSTRACT

Management of documents in organizations is very important in daily routines because documents are a key element in daily operations for storing information for future retrieval. When it comes to an effective and smooth running office environment, there are certain elements that must be implemented, despite the industry you are in. Many organizations use manual system to request and record the movement of documents. Other than that, when the documents need to be stored, they are stored in physical standard way. In most cases the storing has to be done in alphabetical or numbering order. This system lead to misplacement of documents since there is no a system to track the documents location at that particular moment.

Electronic Document Tracking Management System(e-DTMS) is a web-based application that tracks and manages all the students documents movement at any time from one office to another within the university of Dar es salaam .Any office can receive and send documents request at any time. The system enables documents management, document status monitoring and document movement tracking.

ACKNOWLEDGMENT

Firstly we would like to thank almighty God for keeping us strong both physically and mentally also for making us cooperative during the development of the project from the first stage up to this stage.

Also we would like to express our thankfulness to our project supervisor **Dr. KENNEDY FRANK** for his constant motivation and valuable help through the project work up to this stage .

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LIST OF ABBREVIATION.

e-DTMS electronic document tracking management system.

UDSM University of dar es salaam

EFTS Easy file tracking system

FTS	File tracking system
SDLC	system development life cycle
CSS	cascading style sheet.
HTML	hypertext markup language
ERD	entity relationship diagram

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CHAPTER ONE

INTRODUCTION

1.1 General introduction

This chapter is mainly provide the introduction about this project. Mainly it states the problem to be addressed in this project, it clearly provide the objectives of this project which include main objective and specific objective, also provide the significance of this project, scope and limitations of the project and lastly is the organization of the report.

1.2 Statement of the problem

Currently there is a problem of submitting, locating and tracking student letters in different levels of university which leads to poor management of documents especially in the university of Dar es salaam when it comes to point of student submitting their letters like when they want to postpone studies ,to resume studies, freeze studies, to unfreeze studies due to different reasons it will require students to submit their letters physically . So this is conducted physically which made students to be unaware of how their documents are processed and take longer time until to get response.

Therefore we come up with a system called **electronic document tracking management system(e-DTMS)** that will enable students to submit documents (letters) and receive response regardless of their physical location.

1.3 Project Objectives.

The objectives of this project are divided into two main parts which are Main Objectives and Specific Objectives.

1.3.1 Main objectives.

The main objective of this system is to develop a web based electronic document tracking management system.

1.3.2 Specific objectives.

- To collect and analyze the requirements from the students and secretaries from University of Dar es salaam.
- ii. To design an electronic document tracking management system.
- iii. To implement the electronic document tracking management system.
- iv. Perform testing after implementing the electronic document tracking management system..

1.4 Significance of the Project

The implementation of electronic document tracking management system will have the following significance:-

- Student can submit and receive responses of their documents remotely
- Time to search document will me totally minimized since all of its information a in the system.
- Staffs can process students letters and other documents and give response remotely
- The misplacing of documents within organization will be avoided.
- It will increase performance since documents will be received and dispatched at the right time.

1.5 Scope and limitations of the projects

1.5.1 Scope of the project

The scope of this project is intended to develop an electronic document tracking management system for university of Dar es salaam. The system can not be used by any other university as the system was implemented according to UDSM organization structure.

1.5.2 Limitations of the project

There are some assumptions to be taken into consideration for the system to be at work as efficiently as it designed to be.

- i. The system must have an active internet connection to send requests and receive responses.
- ii. The system assumes that the electric power supply is available all the time.
- iii. The system will be used by all students and some staffs involved in students letters processing.
- iv. The system assumes that all users are capable of using computer and internet.

1.6 Organization of the project report

This project is going to solve one among of the problems within the University. This study reviews the electronic documents tracking management only. There are several technologies that can be applied in such a problem but this project is limited to the application of web based system and will be used only under the availability of Network.

CHAPTER TWO

LITERATURE REVIEW

2.1 Issues related to problems we want to solve.

Initially we had a collection of data as source of information about the processes in the current manual electronic document tracking management system which is conducted within UDSM Registry center. We had an oral interview with the secretaries on how they manage student letters and other documents and also from the observation. We went further through research as important source of our references because it helps to gather information for the system we want to develop. Other than that, the research can give assessment towards quality current system and we as developers can conclude as reference to develop a new system which is more quality and efficient though they might differ in some functionalities.

2.2 Fact and finding for electronic document tracking management system.

There are several facts finding used to evaluate and develop a fulfillment system which is under user needs. The fact and finding is Easy File Tracking System. We did learn on how to manage and track documents when they are initialized from the college and the processes within the college which later directed to a specified level in the college.

2.3 Related works.

In order to manage and track files as well as Document within an organization, several countries has tried to develop some related works about this field.

The following are some of lite review in this case study:-

a)Case study 1- Easy File Tracking System

Easy File Tracking System was developed for Jabatan Imigresen Ipoh, one of the institution in Malaysia. The purpose of this system was to help staff at administration and financial department to manage the confidential files and records. It also helps staffs to work more efficient and systematic. This system helps staffs to arrange the department confidential files, correspondences and other documents.

Objectives

The main objective of EFTS is to manage all department file and reducing the problem in the current system. A properly designed EFTS is an interactive software-based system intended to help management staff to compile useful information from raw data, documents and business models to identify and solve problems. The objective of the system is;

- i. To produce online files management
- **ii.** To facilitate staff to manage the department files.
- **iii.** To give action for new contents of files
- iv. To generate files management database
- v. To procure and update files record
- **vi.** To generate report for files management
- **vii.** Reducing administrative costs.

b) Case study 2-File tracking system for university of kashmir.

This is a system developed for the university of kashmir also called FILE TRACKING AND MONITORING SYSTEM (FTMS). The system is used to monitor the movement of files and receipts and assist in their easy tracking. Its features include generation of receipts

and files, updating its status, opening of new files, tracking the movement of files, dispatching letters/files, recording

their track.

b)File Tracking System in New Delhi, India

Other system, which was implemented in New Delhi's Government and which was done by the Department of Personnel and Training of the same National Informatics Center in India, had some similar functions with FTS. It is a web application used inside government to create, send and track their files (receipts). It enables the users to maintain a consistent watch over the movement of various important files in the process of decision-making. It contains a single module for all the staff. The adminisotrator (person responsible for receipts) was the one who created the file (receipt) and forwarded to dealing person to deal with it. The dealing person entered the module and went to the forwarded files section to see the file for further instruction. If the file was ok at all, the dealer was the one who closed the file (cannot be forwarded anymore). This web application was developed for a Forest Department of Pradhya, India. Comparing with File Tracking System it has a lot of disadvantages. One of them is the security issue. In any possible hacking situation, all the files could have been manipulated because of only one module. Also having only a module can make managing harder. A solution to those issues is the creation of multiple modules, independent from each other. Furthermore it is a simple web application that deals only with tracking of file. No other functions are implemented, whereas FTS system has an activity log also implemented in tracking of files.(Bandaya, Sheikha, & Ratherb, 2015)

As a conclusion both of these platforms play a similar role in archiving files however they differ from each other a lot, because one has to deal with physical interference while the other one has to deal with virtual interference

CHAPTER THREE

METHODOLOGY

System development methodology is a framework that is used to structure, plan and control the process of developing an information system. A wide variety of such frameworks have evolved over the years, each with its own recognized strengths and weaknesses, and one system development methodology is not necessarily suitable for use by all projects.

3.1 Project Design

Structured design methodology is used in implementing this project. This methodology adopts a formal step by step approach to the System Development Life Cycle SDLC that moves logically from one phase to another. The SDLC involves planning, analysis, design and implementation. So far this report is still at the analysis stage. The approach for structured design methodology includes Agile method, waterfall model, iterative model

and throwaway prototype. The approach used in this project is the iterative model which is discussed later in this chapter.

3.2 Project Methods.

3.2.1 Requirement Gathering Method

Requirement gathering methods were done through observation, interview and online survey. The requirements are not complete since the users' specifications are not yet clear enough. The following were the captured requirement.

3.2.2 Software Development Method.

PROTOTYPING

The prototyping model is a systems development method in which a prototype is built, tested and then reworked as necessary until an acceptable outcome is achieved from which the complete system or product can be developed.

How Prototyping work

As it is an iterative development process requirements quickly converted to a working system and the System is continually revised. When prototype is shown to the user, he/she gets a proper clarity and feel of the functionality of the software and he can suggest changes and modifications.

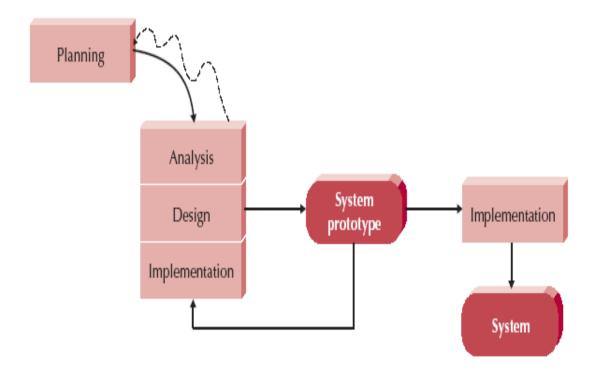


Figure 1: prototyping methodlogy

3.3 Data Collection

The methods used to collect data for UDSM students and secretaries are as follow.

Interview

An oral conducted interview with the UDSM students and secretaries was done with a list of structured questions where more data and requirements were gathered.

Observation

An observation on the current system used at UDSM was done where it was notices that university still use manual system to process students letters physically.

• Online research.

A lot of online research was implemented in literature review phase and on looking for existing systems for electronic document tracking management system.

3.4 Data Analysis.

From various sources cited before a need to automate the electronic document system is so highly in demand. From the interview conducted with the secretaries and students at UDSM, both parties had a wish to convert the all of their document processing system into automated one.

CHAPTER FOUR

SYSTEM ANALYSIS AND DESIGN

4.1 Requirements specification

Requirement is a description or statement of a function that the system must perform or do, It is a feature or condition that a user seeks to have implemented in a system

A requirement is simply a statement of what the system must do or what characteristic it needs to have. Business requirements describe the "what" of the system, and system requirements describe "how" the system will be implemented. A functional requirement relates directly to a process the system has to perform or information it needs to contain. Nonfunctional requirements refer to behavioral properties that the system must have, such as performance and usability. The Methods used to collect the requirements were observation, interview, brainstorming and online search.

4.1.1 System functional requirements

Are those that relate directly to the functioning of the system. These are the aspects of the system the client is most likely to recognize.

Table 1:system functional requirements

Function description	Category
System should allow user to new requests and provide feedback	Evident
from the coming requests.	
System should be able to allow user upload a relevant letter and	Evident
adding supporting documents	
System should be able to track movement of document in each	evident
level of organization	
System should be able to allow user to search documents available	evident
to him/her	
System should able give notification when document received o	evident
dispatched.	
System should allow Administrator to manage All users in the sys-	evident
	evident
System should allow Administrator to delete and add new user	evident
System should verify user using user name and password	Evident
System should be able to group users according to their position	hidden
and level	
	System should allow user to new requests and provide feedback from the coming requests. System should be able to allow user upload a relevant letter and adding supporting documents System should be able to track movement of document in each level of organization System should be able to allow user to search documents available to him/her System should able give notification when document received o dispatched. System should allow Administrator to manage All users in the system System should allow Administrator to delete and add new user System should verify user using user name and password System should be able to group users according to their position

4.1.2 Non functional requirements

They are constraints/restrictions imposed on the system —these may include the use of specific hardware and software and budget and time constraints.

Table 2:System non functional requirements

Attributes	Constraints
Operational	The system should be able to work at any browser
performance	The system should be available for use full time i.e 24 hours
Efficiency	The system should be able to fulfill its purpose with the
	best possible utilization of all necessary resources,
	storage, transmission channels and peripherals
Usability	The system should be easy to use for all type of its users
	and reach the satisfaction level of usability

4.2 Requirements analysis

From the functional and non-functional requirements identified from the above Tables there is a clear view of the capture of the intended behavior for the system which will help that will support easy notification of missing requirements in the future design and implementation phases.

Also from the specification of non-functional requirements it will help in measuring the standards and quality of the system to be i.e. the performance of electronic document tracking management system.

4.3 System analysis

Analysis focuses on capturing the business requirements for the system. Analysis identifies the "what" of the system, and it leads directly into the design phase, during which the "how" of the system is determined. Many deliverables are created during the analysis phase, including the requirements definition, use cases, process models, and a data model

4.3.1 Identification of use cases

In software and system engineering, a use case is a list of steps typically defining interaction between a role known as actor and a system to archive a specific goal. The actor can be human being or an external system which can interact with the system. The use cases and respective actors are identified in table below:-

Table 3:use case diagrams

Use case Actors

Login Student, Staff, secretary

Send request student

Check request status Students, staff, secretary

Process request Secretary and staff

Search for document Student, Staff, secretary.

Tracking Student, staff and secretary.

letter(document)

Delete user Administrator.

Change password Staff, students, administrator.

Report Administrator

Provide feedback Secretary and staff

View document details Student, Staff, Administrator.

Upload the document Students, Staff, Administrator

Update document Administrator.

Logout Student, Staff, administrator.

4.3.2 Use case diagrams

Use case diagram is a representation of a user's interaction with the system and depicting the specifications of a use case. A use case diagram can portray the different types of users of a system and the various ways that they interact with the system. This type of diagram is typically used in conjunction with the textual use case and will often be accompanied by other types of diagrams as well

Use case diagrams are presented in figures:-

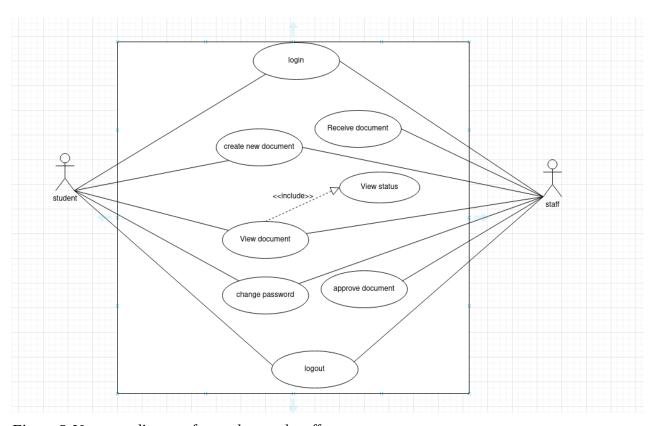


Figure 2:Use case diagram for student and staff

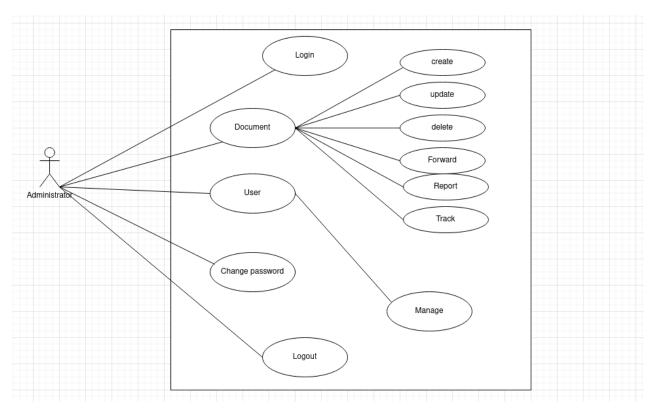


Figure 3:Use case diagram for admin

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4.3.3 Data Flow Diagram (Context diagram)

A context diagram is a level 0 data-flow diagram that identifies the flow of information between

the system and external entities. Context diagram for the electronic document tracking management system is shown below:-

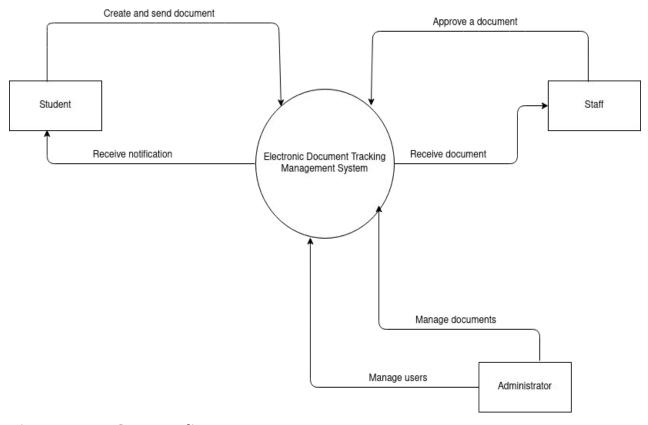


Figure 4:e-DTMS context diagram

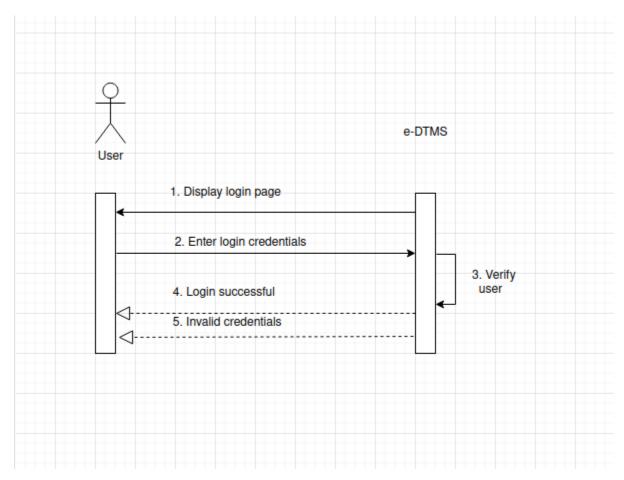
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4.4 System design

4.4.1 System sequence diagrams.

System sequence diagram is the sequence diagram that shows, for a particular scenario of the use case, the event that actor generates, their order and possible inter-system events. Sequence diagrams model the flow of logic within your system in a visual manner, enabling you both to document and validate your logic, and are commonly used for both analysis and design purposes. Sequence diagrams for the electronic document tracking management system we are going to develop are

presented in figures:-



 $Figure\ 5: Sequence\ diagram\ for\ user\ login$

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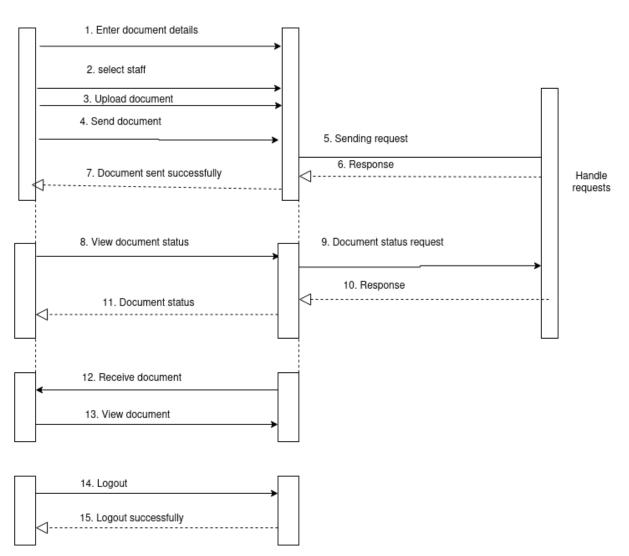


Figure 6:Sequence diagram for student



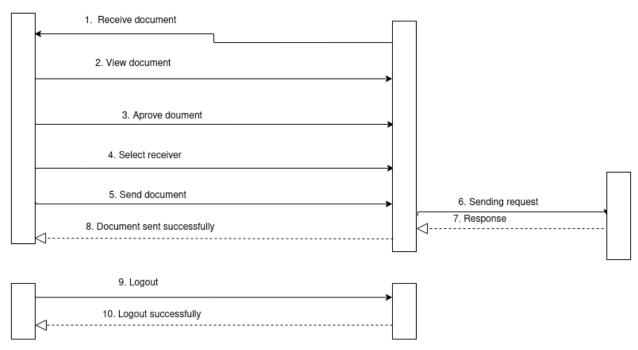


Figure 7:Sequence diagram for Staff

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4.4.2 Database design

Entity Relationship Diagram(ERD)

An ERD is a picture which shows the information that is created, stored, and used by a business

system. The basic steps in building an ERD are these identify the entities, add the appropriate attributes to each entity, and then draw relationships among entities to show how they are associated with one another.

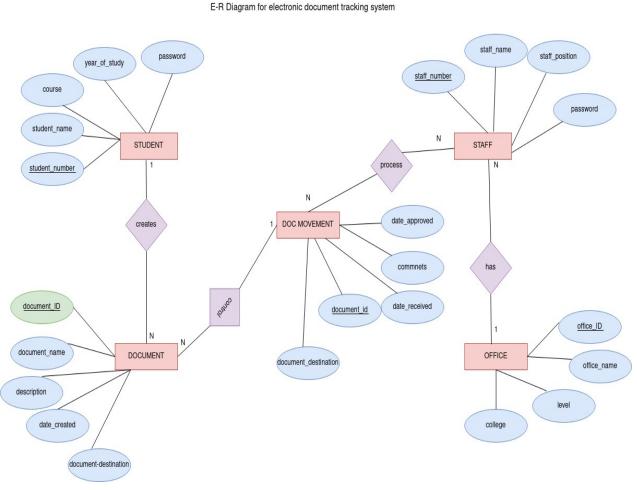


Figure 8:E-R Diagram for e- DTMS

CHAPTER FIVE

SYSTEM IMPLEMENTATION

5.1 System Implementation

System implementation consists of user interface and database implementation for UDSM students, secretaries and staffs. The user interface was implemented using Hypertext markup language (HTML), Cascading Style Sheet (CSS) and JavaScript and the backend is implemented using Node Js run time environment and Express js which is a framework based on Java Script. Database was implemented using Mysql Database as explained in the coming sub chapters

5.2 user interface implementation.

In our implementation of electronic document tracking management system, we have a number of interfaces which helps users to interact with the system in accomplish their tasks according to the functionalities provided by the system.

According to the progress of our implementation here are some of the interfaces in our system.

5.2.1 Login page.

This page has a field to accept username which is a registration number of the user and password. Also there is a link which direct user to the page that will help him/her to recover a forgotten password.

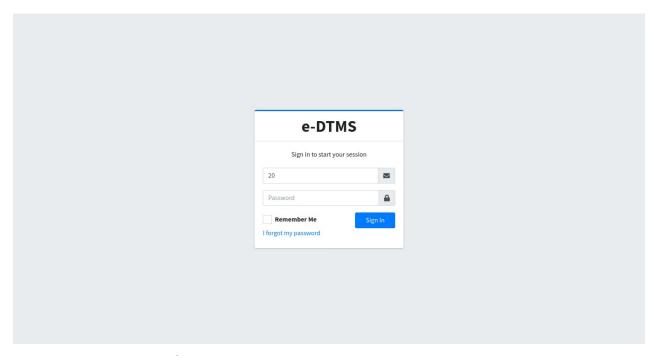


Figure 9:user login interface

5.2.2 Home gape.

After a user has login into the system will be directed to the home page where some statistics of created documents and received documents will be displayed.

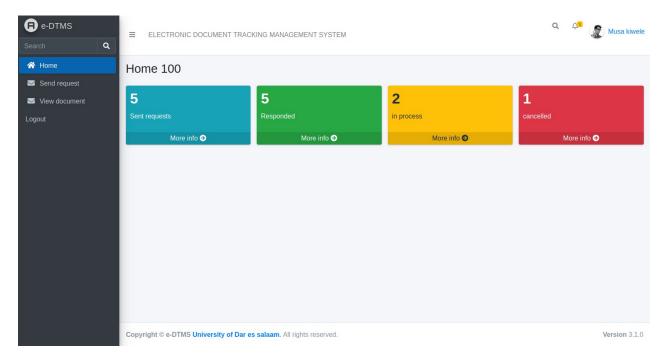


Figure 10:user dashboard

5.2.3 Student request sending page.

This is the page especially for the student to send different requests and when the documents are submitted by student will be directly received by the secretary of respective department.

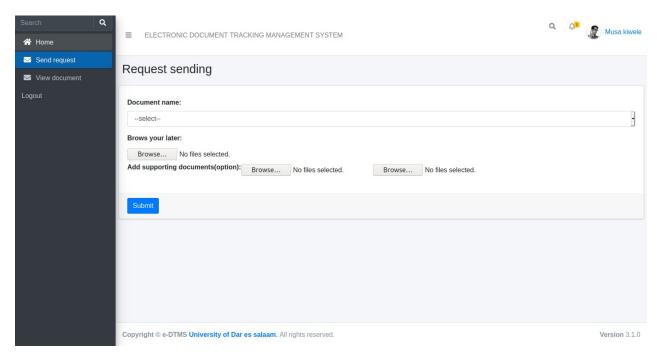


Figure 11:students sending requests

5.2.4 List of submitted and received requests(document).

This page specifically display the list of documents created by the user including their status if are completely processed or are in process.

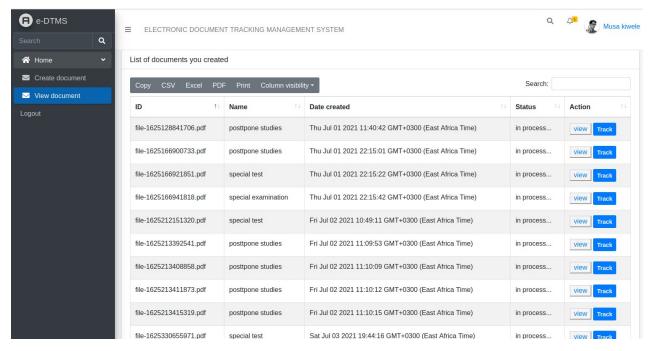


Figure 12:user view document

5.2.5 Received document page.

This page also display the list of received documents after the user has been notified from notification bar near the top corner of the page. It also has an action column which allow user to view and approve document.

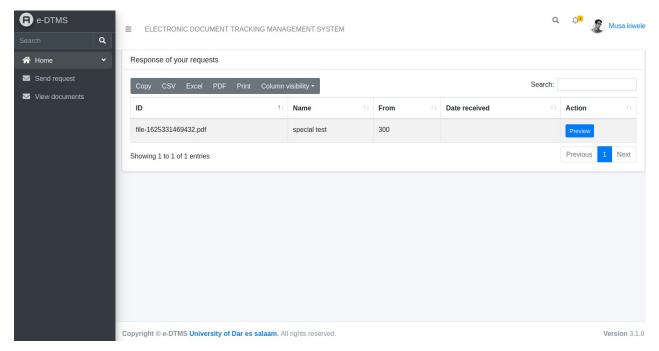


Figure 13:student receive responses

5.2.6 Document approval page.

This page if for staff and secretary where after viewing a document they can approve to send a document to other offices or staff. And also the document can be canceled to send back to the user if there is an error of incomplete of information

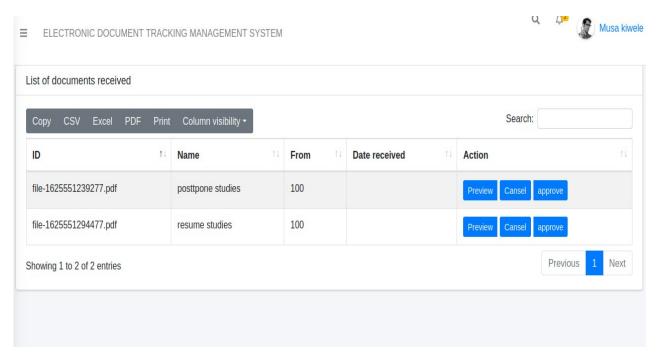


Figure 5.6:staff approve document

5.2.7 Staff cancel the request.

This page is to help secretaries and staff to cancel the request that has an incomplete features

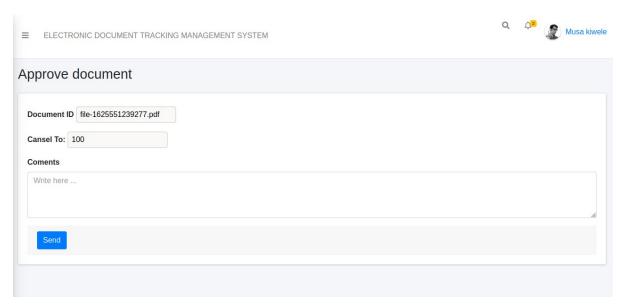


Figure 14:staff cancel document

5.2.8 Staff sending feedback.

Here staff send response to student through a series of offices

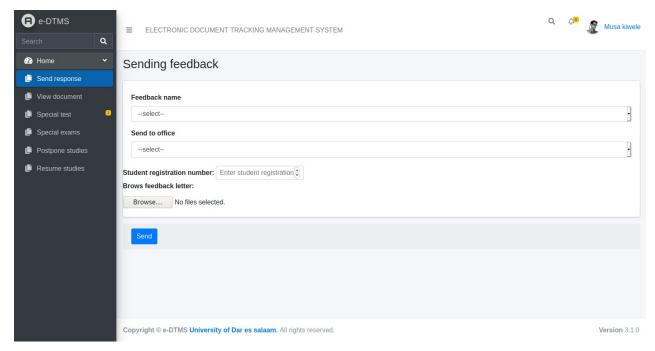


Figure 15: staff sending feedback

5.2.9 Response received to student.

Here the student receive response from the secretary of his or her respective department

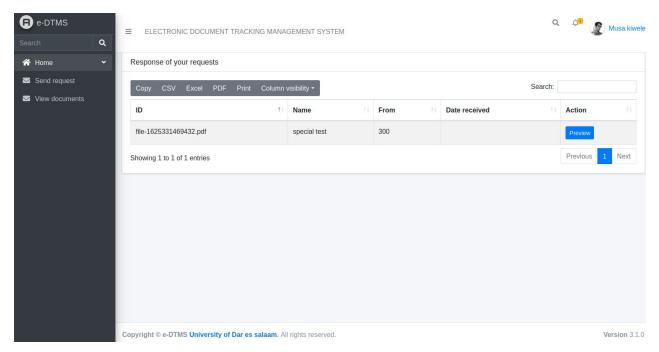


Figure 16:student receive response

5.2.10 user track the request sent to other offices.

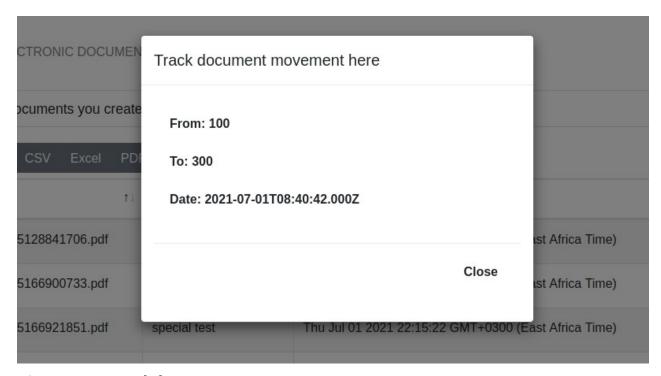


Figure 17:user track document

5.2.11 User receive notification.

The notification is received when request is received or response is received.

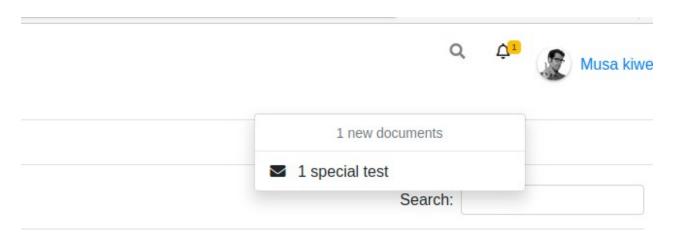


Figure 18:user get notification

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5.2.12 Producing report from the system.

e-DTMS

e-DTMS

ID	Name	Date created	Status
file-1625166900733.pdf	posttpone studies	Thu Jul 01 2021 22:15:01 GMT+0300 (East Africa Time)	in process
file-1625166921851.pdf	special test	Thu Jul 01 2021 22:15:22 GMT+0300 (East Africa Time)	in process
file-1625166941818.pdf	special examination	Thu Jul 01 2021 22:15:42 GMT+0300 (East Africa Time)	in process
file-1625212151320.pdf	special test	Fri Jul 02 2021 10:49:11 GMT+0300 (East Africa Time)	in process
file-1625213392541.pdf	posttpone studies	Fri Jul 02 2021 11:09:53 GMT+0300 (East Africa Time)	in process
file-1625213408858.pdf	posttpone studies	Fri Jul 02 2021 11:10:09 GMT+0300 (East Africa Time)	in process
file-1625213411873.pdf	posttpone studies	Fri Jul 02 2021 11:10:12 GMT+0300 (East Africa Time)	in process
file-1625213415319.pdf	posttpone studies	Fri Jul 02 2021 11:10:15 GMT+0300 (East Africa Time)	in process
file-1625329438187.pdf	special examination	Sat Jul 03 2021 19:23:58 GMT+0300 (East Africa Time)	completed
file-1625329469669.pdf	special test	Sat Jul 03 2021 19:24:30 GMT+0300 (East Africa Time)	completed
file-1625330655971.pdf	special test	Sat Jul 03 2021 19:44:16 GMT+0300 (East Africa Time)	in process
file-1625331469432.pdf	special test	Sat Jul 03 2021 19:57:49 GMT+0300 (East Africa Time)	completed
file-1625377237068.pdf	posttpone studies	Sun Jul 04 2021 08:40:37 GMT+0300 (East Africa Time)	completed

1 of 2

Figure 19:user generate reports

5.3 Database implementation.

The implementation of data base in e-DTMS has gone into series of steps and these are tables that produced

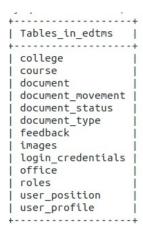


Figure 20:list of tables in database

CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

Development of this project is a long journey but a lot of knowledge and ideas has been gained especially during the case study at the University of Dar es salaam secretaries and students. All these played a big role to understand the problem domain and to come up with this solution. It also supported much during the design and implementation of the system until this end which has been done to satisfactory stage. With this system, it is the help students to send their request(documents) and continue tracking the progress of their requests.

6.2 Recommendation

Final year projects give students knowledge on the software and system developments which is a good start to provide students with knowledge and experiences in the project development field. We recommend that this should continue but students should be provided with enough time to conduct this, and also they should be given support from the staff members in terms of advises as how this is currently done. And also I highly recommend for the time space given to students in doing their final year project should be increased since doing the projects while performing other class studies leads to give small time in doing the project which in turn result to incomplete or weak implementation of projects.

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