# MAKERERE UNVIVERSITY

**DEVELOPING A RECORDS STORAGE AND SECURITY SYSTEM AT UGANDA RAILWAYS CORPORATION**

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THE REQUIREMENT FOR THE AWARD OF THE BACHELORS DEGREE
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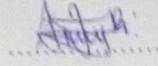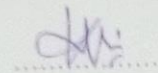KAMPALA.

**OCTOBER, 2022**

## DECLARIATION

We hereby do affirm and declare to the best of our knowledge and understanding that this project report titled "Developing a Records Storage and Security system at Uganda Railways Corporation" is our original composition in relation to our knowledge and field of study at Uganda Railways Corporation and that no duplication of it has been presented by any student in Makerere University or any other University for the award of any degree or its equivalent.

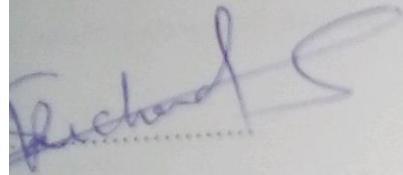|  | SIGNATURE | DATE |
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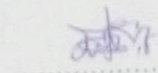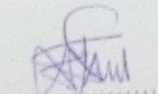
## APPROVAL

This Project Report titled "Developing a Records Storage and Security System at Uganda Railways Corporation" has been submitted with my approval as the University's Supervisor.

14/10/2022

DATE

SIGNATURE

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SUPERVISOR

## DEDICATION

This work is dedicated to different sponsors and parents for the love, good parental care, and financial assistance. Their commitment enabled this Journey to look too straight and smooth, May the Lord reward you all abundantly.

## ACKNOWLEDGEMENT

The completion of this dissertation depended on the great support of many people to whom we owe our acknowledgment. Our special thanks go to our supervisor Mr. Ssenono Richard for his tireless effort in form of guidance. We wish to extend our special thanks and appreciation to family members of the different group members who provided support to us in various forms.

Lastly, we would like to thank the almighty God for guiding us throughout our academic endeavors. We pray to him to bless all those who were there for us.

## LIST OF ABBREVIATIONS AND ACRONYMS

URC     -     Uganda Railways Corporation

EASLIS   -     East African School of Library and Information Science

EARC    -     East African Railways Corporation.

SDLC    -     System Development Life Cycle

DFD     -     Data Flow Diagram

ERD     -     Entity Relationship Diagram

SQL     -     Structured Query Language

IT      -     Information Technology

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**ABSTRACT**

The study aimed at Developing A Records Storage And Security System At Uganda Railway Corporation. Uganda Railway Corporation just like most other institutions of the world still uses manual system. Manual system is based on associations with paper-based records management. The manual system is associated with challenges such as difficulty in retrieval, wastage of time and consumption of office space since it deals with paper based records.

The study was done under the following objectives; To identify the various categories of records that are created and received at Uganda Railway Corporation; To examine the current records storage and security system that is being used at Uganda Railway Corporation; To find out the challenges faced in the records storage and security at Uganda Railway Corporation and To propose solutions to improve on the records storage and security system at Uganda Railway Corporation.

The study used two data collection techniques of interview and observation. The researchers collected data about Records Storage and Security System at Uganda Railway Corporation from 10 respondents including Records officers, records users and IT staff.

The study established that Uganda Railway Corporation generates a number of records which range from administrative records, fiscal, Policy and financial records. The study further established the filing equipment used in filing of Administrative records and they include shelves, cabinets and file folders. The study found out that Uganda Railway Corporation faces a number of challenges such as difficulty in retrieval, less economy of space, low training on records management and less funding.

The research concluded by developing Records Storage and Security System for Management of Records at Uganda Railway Corporation and recommending it for use. The research team stated the design standards and the main functionalities of the system.

# CHAPTER ONE

## INTRODUCTION

### 1.0 Introduction

This chapter comprises of the background of the study, statement of the problem, aim of the study, objectives of the study, research questions, and scope of the study, justification, significance and definition of the operational terms.

### 1.1 Background of the study

Records are essential for the effective and productive functioning of the private and public organizations (World Bank, 2006). Therefore, for any organization to manage its records effectively, they must develop the capacity to manage records and information that will help them make timely, relevant and informed decisions.

Records storage is the housing of active, semi-active or inactive records which must be refined for auditing, regal or reference reasons. Records require storage conditions and handling process that take in to account their physical and chemical properties. Records irrespective of their format require high quality storage and Handling. Records should be stored in such a manner so as to facilitate user access and ensure that they are protected from unauthorized access, use, discloser, removal, deterioration, loss, destruction and misplacement. Security measures protect records from improper access, accidental loss, theft, damage, and unwanted destruction.

Therefore in practice of records storage and security, there is need for every institution to maintain proper records storage and security to ensure effective and efficient administration and performing of the various activities carried out, hence need for the study in order to address the above the issues at URC.

### 1.2 Background of the Organization

Uganda Railways Corporation (URC) is a corporation organization reporting to the Ministry of Works and Transport. It was established under the mandate of the Uganda Railways Corporation Act, Cap331 to carry out railway, marine and road services both in and outside Uganda for the carriage of Goods and Passengers. URC has a total truck length network of 1,266Kms.

The URC is the parastatal railway of Uganda which was formed after the breakup of the East African Railway Corporation (EARC) in 1977 when it took over the Ugandan part of the East African railways. It is a Movement-owned corporation Railway transport industry founded in 1977

The Uganda Railways Corporation offers services like Bulk freight services containers, marine services, passenger transport, warehousing and terminals, real estate and railway workshop. The Uganda Railways Corporation Headquarters in Uganda is located on plot 53, Nasser road, 7150, Kampala city.

## 1.3 Problem statement

Loss and Misplacement of records Is one of the problems faced at Uganda Railways Corporation due to improper records storage and security measures being used. This is due to the limited storage space, and inadequate storage equipment. The absence of a proper records storage and security system has led to records being misplaced or lost during storage or when a record is used, it is either misfiled upon returning to its storage area.

The limited storage space, the inadequate funds and equipment to facilitate the records keeping has led to records loss and misplacement. This does not accommodate all records due to records mainly being paper based which has led to records being stacked and pilled on the floor, others misplaced, unauthorized access by other people and damages. The above problems can be eliminated through reconstruction and rehabilitation of the storage and security system, creating awareness among staff and authentication of the storage systems.

Therefore, the above issues have compelled the researchers to undertake this study on records storage and security at URC, so as to propose the solutions and design a system for proper records storage and security at URC.

## 1.4 Aim of the study

The Aim of the study was to develop a records storage and security system at Uganda Railway Corporation.

## 1.5 Objectives of the study

1. To identify the various categories of records that are created and received at Uganda Railway Corporation

2. To examine the current records storage and security system that is being used at Uganda Railway Corporation.

3. To find out the challenges faced in the records storage and security at Uganda Railway Corporation.

4. To propose solutions to improve on the records storage and security system at Uganda Railway Corporation.

## 1.6 Research Questions

1. What are the various categories of records that are created and received at Uganda Railway Corporation?

2. Examine the system that is being used in records storage and security at Uganda Railway Corporation?

3. What are the challenges that are being faces in the records storage and security at Uganda Railways Corporation?

4. What are the possible solutions that can be put up to improve on the records storage and security at Uganda Railways and Corporation?

## 1.7 Scope of the study

### 1.7.1 Geographical scope

The study was conducted at Uganda Railway Corporation Headquarters which will mainly focus on the records department. The Uganda Railways is located on plot 53, Nasser road, 7150, Kampala, Uganda.

### 1.7.2 Time scope

The study was conducted for a period of three months that is to say from August 2022 to October 2022

### 1.8 Significance of the study

The research outcome will help Uganda Railway Corporation and other stakeholders improve on records management through providing solutions that will improve on URC records storage and security. It will also create awareness to the records staff on the different procedures of ensuring records storage and security, importance of proper records storage and security in terms of confidentiality, and access. The research will help eliminate some of the challenges faced during records storage and security.

The study will enlarge the research skills in records storage and security of the researchers and also fulfil the academic obligations for the award of bachelor's degree of Records and Archives management at Makerere University.

The findings of the study will also benefit the future researchers that will from time to time will refer to the outcomes of this study in their literature review during their research for either Academic purposes or for public/government action purpose.

## 1.9 Study Justification

The study is carried out at URC in order to address the challenges that are related to the records storage and security. The study is important in search a way that it will provide possible solutions to problems faced, this will benefit URC staff and the stakeholders to ensure the records are securely stored and appropriate security measures are put in place.

## 1.10 Definitions of Operational terms

1. **Records:** records are documents regardless of form or medium created, received, maintained and used by an organization (public or private) or an individual in pursuance of legal obligations or transaction of business which forms part of evidence.

2. **Records management:** records management is the systematic and effective control of record (paper and electronic) throughout their life cycle through their time of disposal. It can also be a process of ensuring the proper creation, maintenance, use and disposal of records throughout their life cycle to achieve efficient transparent and accountable governance.

3. **Records storage:** Read and Ginn (2015) defines records storage as the actual placement of records according to a plan on a shelf or file drawer, and also storage can be electronically by saving a record to a medium readable by the computer. It is the maintaining of the records media in a way that records life time is not reduced or minimized in any way for as long as it is needed.

4. **Records security:** records security refers to the policies, procedures and technical measures used to prevent unauthorized access, retrieval and use of records both paper and electronic. Records security is one of the most important aspect of record management which is a long storage discipline in many organizations. Security measures protect records from improper access, theft damage and unwanted destruction.

5. **Storage equipment:** Read and Ginn (2015) defines storage equipment as anything used to house records and archives in safe and secure manner while facilitating ease of retrieval and use. Sufficient and appropriate equipment and materials should be provided for the handling, storage and preservation of records through their life cycle.

# CHAPTER TWO

# LITERATURE REVIEW

## 2.0 Introduction

This chapter presents a review on the literature related to records storage and security. It discusses the literature about the current status of records, types of records, formats for records, storage methods, equipment for records storage and security measures, challenges of to records storage and security and the research gap.

## 2.1 Categories of Records

A record is defined as" recorded information regardless of form or media created, received, and maintained by any institution or individual under its legal obligation or in the transaction of business and providing the evidence of the performance of those obligation or that business" (National Records and Archives Act ,2001).

Paper based records refer to information recorded on any form of paper, which supports the operational function of an organization. A paper record is also referred to as the **hardcopy.**

Electronic records can be referred to as records created, generated, sent, communicated, received or stored by electronic means. These are also referred to machine-readable records. They are data files created and stored in digitized forms through the use of computers and applications software. Also referred to as **Softcopy**

The following are the way in which records are categorized and grouped;

## 2.1.1 Categories of records kept and managed

It's generally agreed today that each organization carries out several activities as may be described in their objectives and such transactions are kept for future references that lead to the generation of different types of records. Stewart & Jeffery, (2002) on the issue say that Organizations carry out different business activities in routine organizational activities and this results into different types of records. The following are the different categories of records managed;

**1. Administrative records:** Read and Ginn (2015), stated that administrative records are records that help employees perform office operations for example, invoices, requisition forms, staff lists and minutes of meetings. They contain adequate and proper documentation of the organization,

policies, procedures and guidelines for example memorandums, reports. Such records deal with many administrative tasks in which administrative results are created.

**2. Legal records:** Legal records have evidence of legally enforceable rights or obligations of the government. Legal records facilitate the organization in complying with regulatory frameworks and audits (Weisinger 2011). They include records relating to property rights: land, contracts, and agreements, leases, and licenses, records relating to citizenship rights: vital statistics, such as birth, death, and marriage, some legal proceedings, and criminal cases.

**3. Financial records:** These are records created for accounting and fiscal use for example financial statements and tax forms, formal documents that are representing the transaction of the business, individual or other organizations. Financial records permit accountants to prepare useful financial reports for managing the organizations resources. Financial records document evidence of finance circulations in organizations, for example financial statements, tax forms, receipt books and payment vouchers.

**4. Operational records**: These records implement administrative policies, procedures and operations as their name suggests, they provide for daily operations of an organization. Penn and Pennix (2017) noted that they provide direction and instructions on how an organization operates. They include mandates, records that give direction, the equipment and visitor's register, organization charts among others.

**5. Historical records:** According to Read and Ginn (2015) historical records are defined as records that document the organization's operations and major shifts of direction over the years for example minutes of meetings, corporate charter, public relations documents. Historical records are also highly worthy of permanent preservation for reference and research purposes are selected because of their historical value.

**6. Personal records:** These include all captured information on employees of the organization including leave records, recruitment or appointment information, posting organization`s structure, pension, salary scales, academic qualifications and transfers among others.

Perhaps we should also point out the fact that the types of records generated by an organization highly depends on the types of transactions carried out in that particular organization thus giving

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room to IRMT (2012) argument that records generated can be categorized under the four categories as below:

Current records. Records regularly used for the conduct of the current business of an organization or individual. Also known as active records.

Semi-current records category; Records required only infrequently in the conduct of current business. Also known as semi-active records.

Non-current records which are Records no longer needed for the conduct of current business. Also known as inactive records.

## 2.2 Current status of records storage and security

### 2.2.1 Management of Records storage

Read and Ginn (2015) define records storage as the actual placement of records according to a plan on shelf or a file drawer or electronically saving it in a folder or electronic media.

Stewart and Melesio (2002) stated that records must be stored so that they can be found when needed, they further stated that records and information managers are responsible for maintaining of the organisations records. The storage of records include keeping them in a safe place free from any interface or damage, unauthorized use and free from physical hazard such as fire and floods.

According to Shepherd (2003), the records and archives section must store and secure both active and inactive records. Jeffrey (2002) agrees with this assentation and goes further to explain four commonly used filing cabinets for storing paper records if an organization is to ensure excellent storage and security for example; vertical filing cabinet, lateral filing cabinet, mobile shelves and open shelves.

### 2.2.2 Methods of filing or storage

Filing means storing information or records in a particular way. This can be in two ways i.e.

Manual filing where paper documents are kept in cabinets like lateral filing cabinet, box file etc. and Electronic filing where records are kept in a database in a computer like Database (Microsoft access), hard disc.

The following are the filing methods for paper records;

**Alphabetical filing.** In this method records are sorted and stored alphabetically by surname of the person or organization that created the record. It is the most familiar form of order for most organisations.

**Numerical filing:** Records are sorted by account or reference number that is assigned to a record on creation. The reference number is the filing point of the records. This method is flexible and expandable since every record is assigned a new reference numbers.

**Chronological filing:** Records are organized and stored following the date the record was created. The newest records or documents are placed or stored at the top or front of the folder.

**Geographical filing:** Records are sorted and stored according to the name of the person or organization where a records is created for example; towns and districts or address of the person which are arranged alphabetically.

**2.2.3 Storage equipment**

Further still Ginn and Read (2008) points out the filing cabinets are storage equipment used to store records.

**Vertical file cabinets:** These are the conventional storage cabinets in one to five drawer sizes each with the rod which helps to hold folders in vertical position. They can be labeled alphabetically or numerically.

**Lateral file cabinet:** Lateral file cabinet has a drawer that opens from the long sides" books like chest of drawer or book case with doors. They provide quick and easy access to records because all records are visible when the drawer is open.

**Mobile shelving.** Records containers (folders and boxes) are stored on shelves that are more on tracks attached to the floor, in some cases these shelving units are not motorized and thus must be physically moved by the operator more often the units are electrically powered which saves time and energy for the operator.

**Open shelving systems.** Help to keep files more organized and in less space than lateral four drawer cabinets and are also much accessible to stuff so they can find and access what they need quickly.

Equipment for electronic records storage include computers with databases and document management software. According to ISO 15489-1 (2001), states that records should be stored on media that ensure their usability, stability, authenticity and preservation for as long as they are needed. Electronic storage equipment include;

### 1. Magnetic Disks

Magnetic disks are storage devices that use a magnetization process to write, rewrite and access information for use. They are covered with magnetic coating and store information or data in form of tracks, spots and sectors. Examples are; Hard disks, zip disks and floppy disks.

### 2. Optical discs

Optical discs are electronic data storage medium that can be written to and read from using a low-powered laser beam. Most of today's optical discs are available in mainly three formats: compact discs (CDs), digital versatile discs (DVDs) and Blu-Ray discs 27 GB. Optical storage media are the best for long term storage.

### 3. Cloud storage

Also called "remote backup, "or "online storage" cloud storage sites allow you to store information on company`s servers; drop box, one drive. Other sites provide these services for free but more storage space is typically available at a fee, other systems like M-files can be used to manage and store records.

### 4. Microfilm and microfiche

Microfilm is a storage medium that contains small images of records on roll or sheet of film. Documents may be stored on a roll of microfilm or on sheets, of film called microfiche.

Storage equipment is used to house records and archives in a safe and secure manner, while facilitating ease of retrieval for reference purposes. In selecting suitable equipment, number of factors need to be taken in to consideration like;

- Security
- Current and forecast volume and nature of the records or archives to be stored.
- Current and forecast volume and nature of use.
- Speed of retrieval required
- Cost of equipment

- ‣ Space requirement.
- ‣ Records security.

## 2.2.4 Management of Records Security

Security in this context refers to the policies, procedures, technical measures used to prevent unauthorized access, retrieval and use of records both paper and electronic. Security measures protect records from improper access, accidental loss, theft, damage and unwanted destruction.

Security ought to be the top priority in every organization, not only against the more dramatic risks but against every day risks such as stealing by the public and staff, against fire and against carelessness. In large organizations security is under the control of senior executive.

## 2.2.5 Selecting security equipment

According to Micheal Workman, (2008) breakings do not often occur in archival repositories. He therefore believes that the greatest threat to records and archives is from thieves posing as users and vandalism by disgruntled staff. He therefore suggests that it is important to ensure that institutions are secure particularly during evenings or weekends or other times when staff is not present. According to him, the following security equipment should be installed if possible.

1. Good quality door locks, such as mortise locks which have a dead bolt attached

2. Good quality hinges, with fixed-pin hinges that cannot easily be removed .so the thieves cannot easily by-pass the locking system and remove the entire door by hinges.

3. A separate, locked vault to hold particularly valuable items; such a vault should have at least one good quality lock such as mortise lock. Or ideally a double locking system.

It is critical to remember to lock areas securely whenever necessary, even when people are leaving the room or building only for an hour or less. There must also be a system for key security that ensures that only authorized persons have access to the keys.

Shepherd E, (2003), proposes some security measures that can largely aid in protecting the electronic records thus installation of Uninterruptible power sources (UPS) or battery backup systems to provide standby power to a computer system, use of authentication systems to protect data in a computer or computer network by controlling user access, black box technology which

involves the use of a communication security device that contains information about authorized users, use of virus protection software can also aid in detecting viruses that may corrupt the data.

The following can be the security measures that protect electronic records;

Virus defenses; these are software types that prevent the spread of unwanted viruses. These anti-virus software turns in the background popping up regularly to re assure you that there are detected viruses.

Security codes; this are mainly passwords that end users are asked which consists of letters or numbers that are majorly required in order to access a file. However different passwords can be given for reading or writing a file.

Firewalls. These serve as gatekeeper systems that protect an agency's computer networks from intrusion by providing a filter and safe transfer points for access to and from the internet and other networks. The good thing with this is that it screens out all network traffic and only allows authorized transmission in and out of the networks.

Biometric security measures. These are security measures provided by computer devices that measure the physical traits that make each individual unique in order to allow them access network resources. These biometric control devices use special purpose sensors to measure and digitize a biometric profile of individuals like fingerprints, voices or other physical traits.

Ekwaro (2006) suggested that the use of identification codes, passwords for electronic records, employment of security personnel in and around the records, the use of surveillance security systems like CCTV cameras and tightening the security checks for the users entering and leaving records areas.

**2.3 Challenges faced in Records storage and security**

**2.3.1 Challenges to records Storage**

**Paper Based Records**

**1. Loss and misplacement of records:** Most organisations face a challenge of loss and misplacement of records which is as a result of theft, misfiling. In this context, someone in the organization can borrow the file and on return they misplace of misfile it.

**2. Limited storage space:** Registries, records centers and archives have inadequate storage space for paper based records due to high number of records accumulating every day. The space to which records can be put is small as compared to the rate of their increase and disposal. Hence records being piled on the floor exposes them to destruction by pests, light, floods, temperature and relative humidity.

**3. Disasters:** This can be sudden happening that can occur and cannot be ruled out because sometimes they happen and cause a great damage or loss or destruction of a record. They include man-made disasters like chemical spills, explosions, and building deficiency.

**4. Inadequate professionalism in records management:** there is inadequacy of professionalism among records staff who manage records in organizations and other records users. Due to limited skills required for managing records throughout their entire life cycle.

**5. Dust and Dirt:** this is a serious challenge in most organisations especially those near the industrial areas which affect both paper records and electronic storage equipment. Dust from flying particles, soil and pollution become embedded in the surface of the records which become moist through high relative humidity which leave permanent stains on records.

**Electronic Records**                                              .

Brendan (2012) stated that the growing use of information technologies in records storage creates a lot of problems in securing of records in both public and private organizations. He added that in Africa most of the countries have few knowledge on proper management of electronic records.

1. **Computer Virus:** These are rogue software program created and designed by malicious computer wizards and these attach themselves on other computer programs such as the recycle bin, Microsoft office among others.
2. **Malware:** Which is referred to as the malicious software program designed by malicious computer wizards these can be attached to a document and immediately someone opens the document it can easily crash down and lead to its distraction.
3. **Incompatibility and interoperability of data storage media and systems:** Increasing data storage capacities and the fast development, implementation of proprietary compression and back up technologies are hastening the obsolescence and increasing the incompatibility and interoperability of data storage media and systems.

## 2.3.2 Challenges to Records Security

These can be seen as:

**Human threats**: These are events that are either enabled by or caused by human beings including unintentional acts and deliberate acts like unauthorized access to confidential information, network-attacks and malicious software, shared printers, hacking and cyber vandalism, phishing, fire outbreak, misfiling.

**Natural threats**: These can be sudden happenings that occur unknowingly and they can include events resulting from forces of nature such as landslides, floods, electrical storms and earthquakes.

**Environmental threats**: These consists of conditions such as liquid linkages, pollution and chemicals spills, pests and rodents, moisture and temperature.

## 2.4 Solutions to Improve on the Records Storage and Security

## 2.4.1 Solutions to Records Storage challenges

## 1. Biometric machines

These are used to detect someone if they are the authorized person to access and retrieve the record for example use of the eye, finger print and in this way one is required to either look through or put their finger on the machine to authenticate them, it applies on both the paper and electronic records.

## 2. Use of air conditioners

Conditioners help regulate the temperature of the storage areas in order to avoid temperature changes like moisture which can lead to growth of the molds and fungi in the records which destroys them.

## 3. Identification and assessment of records storage areas

This practice includes identification and assessment of probable causes of concern such as heating, fire, electronic faults, and flood. Computer failures, viruses in electronic storage devices, backup devices and other external and internal issues. This storage practice makes any issues relating to records storage to be detected earlier enough and corrected before the situation gets worse (Weisinger 2011).

**4. Awareness and Training**

As part of records storage sensitization program, organizations carry out staff training on the modern and best practices for records storage, vulnerabilities to records and other issues and this is mostly done through workshops and seminars. This makes the records staff and users to be abreast with up to date knowledge on records storage.

**5.  Radio Frequency identification (RFID)**

RFID, or 'Radio Frequency Identification', refers to the use of radio transponders attached to individual items like file folders, boxes, books which can then be 'found' electronically

**6. Setting up rules and policies on records management**

 Rules and regulations, policies govern the organization in proper records management for example they guard records against hazards that pose specific dangers to records such as no smoking, access to records among others (Ganghemi and Lehtinen 2016). Putting notices such as 'no smoking', 'no food and drinks' in the storage area. They guide the management, staff and users while using the records

**7. Digitization**

Digitization refers to the electronic process of converting a document in a non-digital Medium into digital form for storage, retrieval and transmission. It is a process of transferring print media into a computer readable format, and organizing and presenting that data in a way that is useful to users.

**2.4.2 Solutions to Records Security Challenges**
1. **Installation of security software:** e.g. antivirus, spy ware, firewall, in order to avoid viruses, worms and the Trojan horses that disable information systems.
2. **Access control**: Refer to policies and procedures an organization uses to prevent improper access to the system. Access control involves the installation of security guards and storage areas limited to only staff.
3. **Installation of digital cameras/ CCTV:** This can be done through installing cameras in different access points to enable easy monitoring of records movement and authentication. Someone seats at a certain point where he or she can view whatever is taking place in the records Centre.

4. **Digital signatures and digital certificates**: help with authentication. The electronic signatures in the global and electronic transaction Act of Uganda has given digital signatures the same legal status as those written on paper. The e-pad family of electronic signature pads enable you to sign, send, and store documents electronically without the need to print or scan paper forms

5. **Installation of detection systems**: like alarms that can create awareness to the staff incase unauthorized person tries to access the storage areas and retrieve the files.

6. **Information backup**: different forms of information can be recovered through the use of maintenance of appropriate backup copies on the different backup equipment such as CDs, DVD, Flash disks, and online storage.

# CHAPTER THREE

## RESEARCH METHODOLOGY

### 3.0 Introduction

This chapter presents the research design, area of study, population, sampling and sample size, sampling size, sampling techniques/strategy, data collection methods, data collection tools, validity, research procedure, data analysis and presentation, ethical consideration, limitation of study, time frame.

### 3.1 Research Design

(Cunningham & Montana, 2006) Defined a research design as a blueprint for conducting a study with maximum control over factors that may interfere with the validity of the findings.

It involves arrangement of conditions for collection and analyzing of data in a manner that aims to combine relevance to the research purpose. The researchers used qualitative research approach which will enable them to understand their experiences. It helped answer questions of who, how, when, what and where ass associated with particular research problem.

### 3.2 Area of Study

The study was conducted at Uganda Railway Corporation, a government institution under the Ministry of Works and Transport, the Records department was the focus of the study because it's the center of knowledge about records storage and security and it manages a lot of records that are generated as a result of the daily activities that are carried out in various departments in URC like human resource department, finance and administration among others,

### 3.3 Study Population and Sampling

Kombo (2006) defines population as any set/group of persons, objects/elements that possess at least one common characteristic from which the researcher obtains information. Its entire aggregation of items from which samples can be drawn. The staff of URC and other stakeholders was the target population where a sample was generated from.

Khan (2011) defines sampling as a portion of the population which is deliberately selected for research. It's also a process of selecting a number of individuals or objects from a population such that the selected group contains representatives of the characteristics found in the entire group. The sampling was taken from the URC staff which was the target population.

### 3.4 Sample Size

Sample size refers to the number of respondents the researcher intends to interact with and collect information. The sample size of this study will be determined with reference to the researcher's interest and constituted people according to the organization set up in the records department.

### 3.5 Sampling Technique/strategy and method

Paul & Lemeshow (2008) defines sampling techniques as a mechanism used to select a sample. The researchers will use a non-probability sampling technique to select the essential respondents relevant to the study based on personal judgment of the researchers while basing on professionalism and experience of the respondents in relation to field of study.

The methodology that was used to sample from a larger population depended on the analysis being performed. Therefore, the researchers used purposive sampling method where only staff with knowledge and experience in records were consulted in order to get accurate information as it proved to be the best way to find respondents knowledge about records storage and security.

### 3.6 Data collection Methods

These are methods or techniques that was used to collect research data. In order to collect data relevant to the field of study, the researchers used interview method, document analysis and observation method.

### 3.6.1 Document Analysis

It consists of analyzing the contents of documentary materials such as books, newspapers and content of all other verbal material which can be spoken or written, (Kothari, 2004).Under this method both published and unpublished reviewed resources which involved books, reports, records, journals and internet resources are used by the researchers. The documents were used in search of information about the study that included both secondary and primary information sources.

### 3.6.2 Interview

Wendy, (2012) defines interview as a face to face conversation between the researcher and a respondent(s) conducted for purposes of obtaining information. The interview method of collecting data involves presentation of oral-verbal stimuli and reply in terms of oral-verbal response, (Kothari, 2004). An Interview can be conversation between two people on telephone or

face to face with the objective of collecting relevant information for the purpose of research or study. Here the researchers will have a face to face conversation with the head of the records department at URC with structured questions in order to get the rightful information needed for the study.

### 3.6.3 Observation

(Trochim, 2015) States that observation involves observing and measuring the world around you including observing the people and other measurable events to gather explicit data. Observation can be defined as a purposeful examination of research phenomenon for purposes of gathering data. It involves the use of sensory organs to make sense of this study phenomenon. This method was chosen because it provided the advantage of eliminating bias that may not be presented by the respondents.

Observation is a good technique especially for activities that could be measured for example; physical storage mechanisms, physical security, conditions of equipment especially computers and storage cabinets and shelves, storage and security systems, time spent in retrieval of records, storage space, storage equipment for electronic records.

### 3.7 Data Collection Tools

### 3.7.1 Interview Guide

Interview guide is a set of questions that are used for guiding researchers and respondents while conducting interviews. When conducting interviews or face to face dialogue with the head of department, the researchers designed question that was shared with the respondent before the interview, these questions directed them while interacting with the respondent in order to get relevant information and to avoid confusion.

### 3.7.2 Observation Guide

Observation guide is being used by the researchers. It was used to collect data in a particular setting, therefore the observations focused on the setting and activities being carried out in relation to records storage and security. This instrument was used by the researchers where they observed the environment and noting down their remarks without any communication being made.

### 3.8 Validity and Reliability of research instruments

**Validity:** Validity is the most critical criteria and it indicates the degree to which an instrument measures what it is supposed to measure, (Kothari, 2004)The data collection tools, especially the interview guide must always be pre-tested to rectify errors or mistakes, ambiguous questions that may not be easy to understand by participants or respondents.

**Reliability:** Reliability, like validity, is a way of assessing the quality of the measurement procedure used to collect same data consistently under constant conditions. The reliability of a research instrument concerns the extent to which the instrument yields the same results on repeated trials (Neuman, 2014). In order for the results from a study to be considered valid, the measurement procedure must first be reliable (Stephanie 2016).

### 3.9 Data Analysis and Presentation

Data Analysis: According to (Kumar, 2011), content/data analysis is an analysis of the contents of interviews or observational notes in order to identify the main themes that emerge from the responses given by respondents or the observation notes made by the researcher. The researchers conducted qualitative analysis of data attained from the data collection process. This involved refining data during and after collection to sort out mistakes and errors, coding the data by building themes and sub themes, systematic description of the contents of the data in a reduced form.

Data Presentation: Finally explanations of meanings, interpretation in relation to research objectives, discussions, and conclusions from the emerging information, were drawn and presented thematically as per the propositions of this study. This was through charts and tables etc.

### 3.10 Research Procedure

Research procedure refers to the various steps or actions that the researcher will take in order to conduct or carryout the study from the beginning to the end. It involves the rationale for application of procedures that used to identify, select, collect and analyze the research process.

The researchers selected a topic with the guiding objectives that was approved by research coordinator. This is followed by writing of the proposal which was approved by the research supervisor at University level. The researchers then were availed with introductory letters by the head of department, Records and Archives management at EASLIS that introduced them to the organization where the study was conducted from. The researchers acquired permission from the

field or organization that authorized them to carry out the study. The researchers then collected data, analyzed and presented it to the supervisor for review. The researchers compiled final project report and submitted for evaluation after attaining the necessary approval from the supervisor.

## 3.11 Ethical Considerations

Ethical considerations are issues of getting permission and approval from different levels of authority and how the researchers treated the data collected. The researchers acquired permission from the organization before proceeding to collect any information.

The researchers were expected to respect the dignity of the research participants, make consent with the organization in order to abide by their rules and regulations. The researchers ensured the protection of the privacy and confidentiality of data collected.

## 3.12 Study Limitation

Limited prior research studies on the topic of electronic storage system. Citing prior research studies forms the basis of the literature review and helps lay a foundation for understanding the research problem being investigated. Limited research studies on the topic of electronic filing limited the citation.

Longitudinal effects. The time available for the investigation of the research problem is limited and informed constraint if all the relevant procedures are not executed timely such as approval of the proposal and acquisition of an introduction letter. The research team however ensured timely execution of the study steps which enabled compilation of this project a success.

Resource Limitation. The research process needed much facilitation, the research team faced the challenge of funds; however, it to adjusted in all situations to achieve the general objective of the study.

# CHAPTER FOUR

# PRESENTATION, ANALYSIS AND DISCUSSION OF STUDY FINDINGS

## 4.0 Introduction

This chapter presents the findings of the study, analysis and data collected from sampled respondents at the Uganda Railway Corporation. The analysis was done based on the items in the interview guide and observation guide  as organized in line with the research questions and objectives stated in chapter one and they are presented in terms of distribution tables, graphs and pie charts to give better explanations and also make the analysis easier.

## 4.1 Response rate

This was the least aspect on the analysis which deals with the basic data on the respondents. It was important to find out from the respondents their age, gender, years at service and education back ground and category of staff. These specific characteristics would affect their participation in the study because individual responses on some issues may vary.

The data that involves the respondents' age, gender, years at service, education back ground is presented as follows.

## 4.1.1 Age distribution of respondents

*Table 1: Showing Age Distribution of Respondents*

| RESPONSE | FREQUENCY | PERCENTAGE (%) |
|---|---|---|
| 25 years below | 2 | 20 |
| 26 – 35 years | 5 | 50 |
| 36 – 45 years | 2 | 20 |
| 46  years and above | 1 | 10 |
| Total | 10 | 100 |

Table 1: illustrates the age of distribution of the respondents, 5 (50%) of the respondents were within the age bracket of 26 years to 35 years. 2 (20%) were within the age of 36-45 years, 1(10%)

of the respondents were within the brackets of 46 years and above while 2(20%) were between the age of 25 years and below. This implied that majority of the staff were below the age of 36 years who are very energetic and can help the organization achieve its target objectives and goals.

### 4.1.2 Gender distribution

*Table 2: Showing the Gender Distribution*

| RESPONSE | FREQUENCY | PERCENTAGE (%) |
|----------|-----------|----------------|
| Male | 3 | 30 |
| Female | 7 | 70 |
| **Total** | **10** | **100** |

*Figure 1: Showing the Gender Distribution*
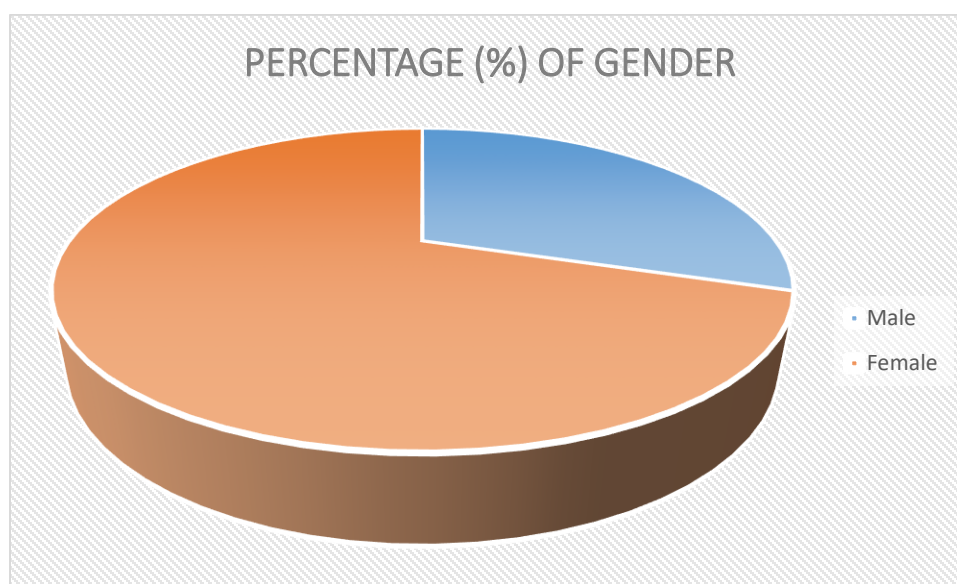


Source: Primary Data 2022

Table 2 shows the gender distribution of respondents. Clearly it can be seen from the table that female respondents dominated the study responding 70% with a frequency of 7 while 3 (30%) of the respondents were male. This confirms the perception that administrative duties are a female dominated and that male do not generally show interest in that.

**4.1.3: Number of years worked**

*Table 3: Showing the Number of years worked*

| RESPONSE | FREQUENCY | PERCENTAGE (%) |
|----------|-----------|----------------|
| 0 - 5 years | 3 | 30 |
| 6 – 10 years | 5 | 50 |
| 11 – 15 years | 2 | 20 |
| 16  and above | 0 | 0 |
| **Total** | **10** | **100** |

Source: Primary data, 2022

Table 3 indicates that number of years' respondents have worked at the Uganda Railway Corporation.  3 (three) respondents representing 30% of them have worked for five years, or less, 5 (Five) of the respondents making 50% have served for at least six years but not more than 10 years and 2 (two) representing 20% of the respondent have worked at the Uganda Railway Corporation for years between 11-15. While none of the respondent has served the organization for more than 16 years. It therefore indicates that respondents have experienced in proper records management.

**4.1.4: Education background for respondents**

*Figure 2: Showing the: Education Background for Respondents*
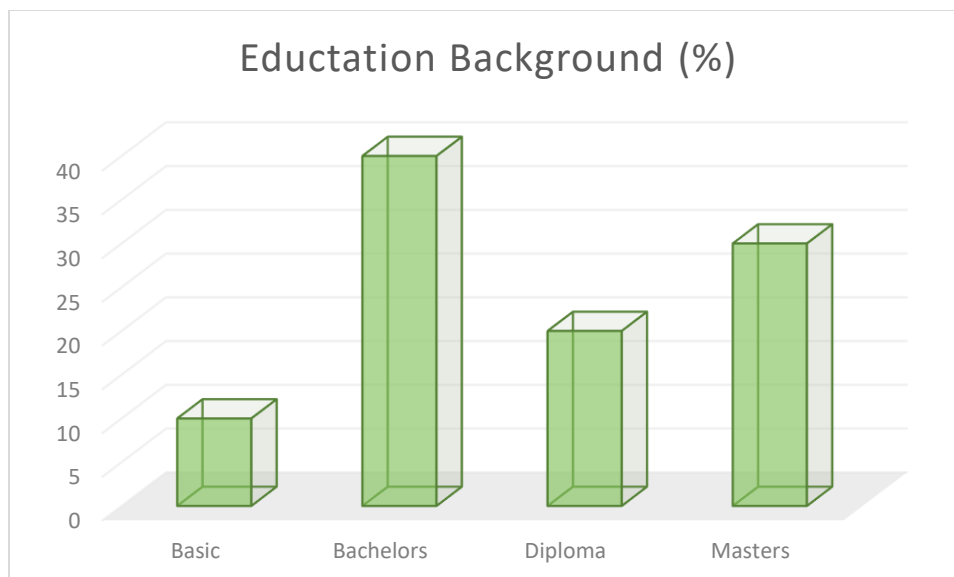
Figure above shows the education back ground of the respondents. Four (40%) of the respondents hold Bachelors, 2 respondents making 20% have had a Diploma and 3 of them representing 30% have completed Masters while only one of the respondents had only basic education. This gives the majority of the respondents are university graduates which is increases the efficiency and productivity of the organization because highly qualified staff are attributed to higher levels of productivity.

## 4.1.5: Category of the respondents

*Figure 3: Showing the Category of Respondents*
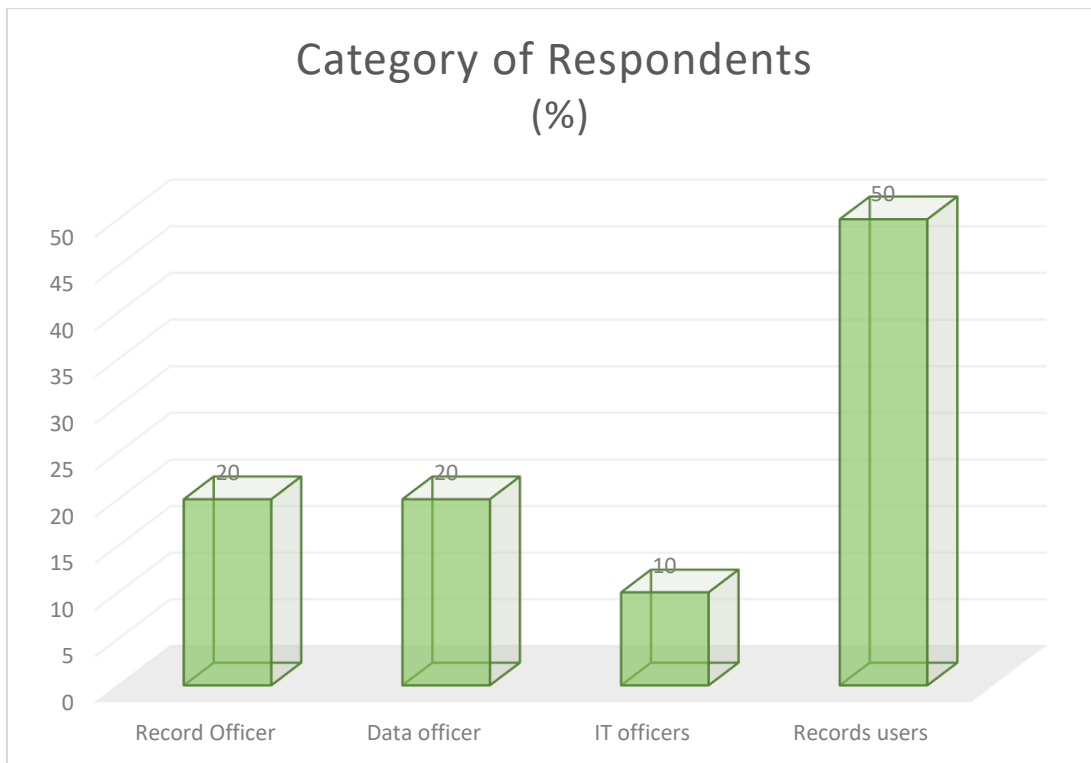


Source: Primary Data 2022

The figure above depicts that 2(20%) of the respondents, were Record Officer, 2(20%) of the respondents, were Data Officers and 1(10%) of the respondents were Information Technology officers whereas 5(50%) were users of the records. Therefore, the results show that majority of the respondents were records users who associate so much with the records and poor storage and retrieval of the records can affect their decision making processes.

## 4.2 Types of records that are created and received at URC

### Administrative Records

Records which pertain to the origin, development, activities, and accomplishments of the agency

### Policy Records

These are records that relate to the organization such as plans, methods, techniques, or rules which Uganda Railway Corporation has adopted to carry out its responsibilities and functions. These include three basic categories. Budgets and budget planning records, organizational and functional charts.

**Governing Documents:** Such as manuals, directives, orders, and interpretations issued from top authority levels, correspondence files of high-level officials, regulations, circulars, instructions, memoranda or regular issuances that establish a course of action, and staff studies or special reports relating to methods of workloads and performances.

### Personnel Records

The study through interviews revealed that the records department manages personnel records which are created from various departments at URC however some are received from various employees of the organization while performing their duties and upon deployment.

**Reporting Documents:** annual reports, periodic progress or summary reports, special reports or accomplishment, transcripts of hearings, minutes of meetings and conferences, and agency histories.

### Operational Records

Records necessary to implement administrative policies, procedures, and operations. The operational value is the usefulness of a record in the conduct of an organization's business. Examples include mandates, procedural records, or records that give direction.

**Legal Records**

At Uganda Railway Corporation, records of legal value include those with evidence of legally enforceable rights or obligations of the State. These include: Records relating to property rights: land, probate, contracts, agreements, leases, licenses.

**Appointment letters:** these are records issued by the employer to an employee clearly specifying the terms and conditions of the job given.

**Fiscal Records**

Records that have fiscal value relate to URC's financial transactions. These include budgets, payrolls, vouchers, and accounting records.

**Archival Records**

Records worthy of permanent preservation for reference and research purposes are selected for deposit in the URC's Archives. These records are retained for many uses. They are used to protect the organization, to give consistency and continuity to their actions, to prevent duplication of efforts, and to find successful ways for solving recurrent problems.

**Research Records**

Records used in scholarly studies and investigations. These include the documentation of project research carried by the staff or Uganda Railway Corporation to improve the organization. They include the digitization report, statistical data revealed from data collection

**Electronic Records**

These are records created, generated, sent, communicated, received or stored by electronic means, including, but not limited to, facsimiles, electronic mail, telexes and internet messaging. Electronic messages sent or received in the conduct of the URC business are kept in their electronic form for references.

**4.3 The current records storage practices at Uganda Railway Corporation**

Uganda Railway Corporation stores and manages both paper and electronic records. A records storage facility is designed for the sole purpose of providing long-term storage to protect and preserve business documents, papers and important information.

The current storage practices for papers-based records as revealed by the records officer are;

**Lateral filing**: This is done in four-drawer filing cabinets, with the files held upright on their long narrow edge, often within a 'hanging folder'.

**Vertical filing**: This is where files are held upright on their short narrow edge with their 'spines' facing outwards, is done in cupboards (which may or may not be enclosed) or on racking or shelves.

**File Stacking**: The stacking method stores files flats, one on top of the other, with the spines of the files facing out.

The Electronic Records Management practices currently practiced at the Uganda Railway Corporation as revealed by the respondents are summarized as below

Backed up regularly

Compliant with all privacy and security requirements

Network or cloud based and allows for shared access

Organized in such a way that records can be identified and purged appropriately

Able to migrate content to a new system upon replacement

Maintained through regular software update

**4.3.1 The equipment used for the storage of records at Uganda Railway Corporation**
**Files**

It revealed that 10 of the respondents mentioned files as one of the filing equipment's used in the organization because most of the letters are filled and placed in different files (box files, and spring files)

**Cabinets**

The study also established that cabinets were also one of the materials used in filing active records like letters, correspondences and other documents with 5 of the respondents mentioning it.

**Shelves**

It was revealed that most of the records were filed in shelves in the human resource and records center with 13 of the respondents mentioning it.

**Boxing**

The respondents also revealed that in the archival center, records were stored through boxing. Records are kept and stored in boxes which are strong, resistant to water, acid free.

**USB flash drives**

**Hard drives**

**4.3.2 The record's security measures put in place by the Uganda Railway Corporation**
**Locked Storage Areas**

Using locks in storage areas like filing cabinets is one of the methods for securing records at Uganda Railway Corporation. By keeping them locked it will keep prying eyes away and the records safe from theft.

**Fire and Flood Protection**

Although natural disasters are still a risk to filing cabinets in an office even if they're locked, fire extinguishers and water Alarms are installed which are automatically triggered in case of a disaster.

**Checks in and out of the Organization:** thorough checkups are carried out at URC upon accessing the organization

**Use of visitor's tags given at reception:** visitors are issued with identification tags from the reception that indicate the office of access and tag number.

**Duplication and Dispersal**

Dispersal is the practice of maintaining copies of a vital record in more than one location on the assumption that a disaster is unlikely to affect two different locations at the same time.

## 4. 4 Challenges faced by Uganda Railway Corporation

*Figure 4: Showing the Challenges faced by Uganda Railway Corporation*
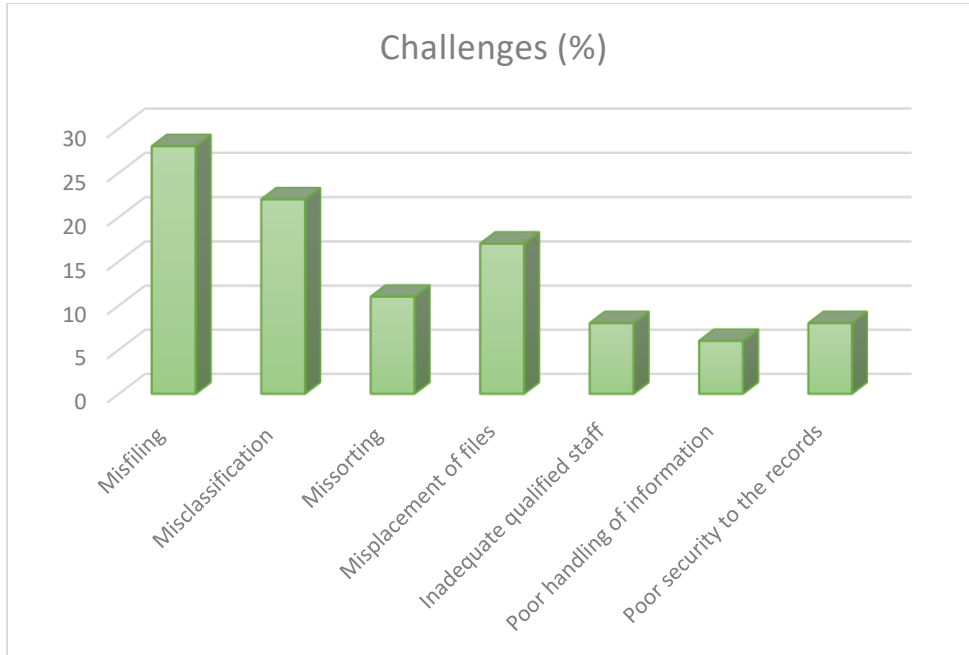


From the figure  above, most of the respondents 28% mentioned misfiling caused due to poor filing skills, 22% of the respondents mentioned misclassification caused by poor sorting and indexing of records, 11% of the respondents mentioned missorting of records caused by misidentification of the subjects, 17% of the respondents mentioned misplacement of files caused due to poor security and mishandling of files, 8% of the respondents mentioned inadequate qualified staff, 2(6%) of the respondents mentioned poor handling of information while 8% of the respondents mentioned lack of enough security to the records.

# CHAPTER FIVE

# THE PROPOSED RECORDS STORAGE AND SECURITY SYSTEM AT UGANDA RAILWAY CORPORATION

## 5.0 Introduction

This chapter describes what was involved in coming up with the system and how the system works. It covers the modelling process, system testing and implementation

## 5.1 System Overview

The system encompasses all the activities associated with the records creation, storage and security of records which are integrated in the URC Records Management System. The main functionalities available in this system are;

- Records capture
- Access control
- Storage of records
- Filing records
- Indexing of records
- User management

All these features include the ability to create, update (edit), retrieve through search results and truncate obsolete records. It also contains a report generation system that can be saved in a pdf file format.

## 5.2 Approach for the Development of the Records Storage and Security System

The system development life cycle (SDLC) we chose to use the iterative waterfall model. In this model, the system follows a series of events from the requirement definition, system and software design, implementation and unit testing, integration and system testing and operational maintenance. We also used different aspects from other models like prototyping which helped us come up with system definition and analysis, data flow diagrams (DFD) and entity relationship diagram (ERD). The ERD was used to show the relationship between entities while the Data Flow Diagrams were used to show the flow of data in the system.

Alterative waterfall model divides the system development lifecycle into phases. During each phase of the lifecycle, a set of well-defined activities are carried out for instance at the Analysis

stage (structured analysis of requirement) was specifically carried out in focus of the functionality of dataflow at Uganda Railway Corporation. The system and structured analysis were then transformed into software design (software architecture to decompose the system into modules and representation of relationships among the modules, data structures and algorithms for the modules to be designed

### 5.2.1 System Requirements

The system requires a client-server architecture where a server is necessary to host the application and the database. The users can access the server to retrieve information from their desktops through their client-based interfaces. For this to work, the following is required;

### 5.2.2 Non-functional Requirements

Non-functional requirements are described as the constraints on the services the system provides and they include;

- Users must login in order to access the system resources.
- All staff who intend to use the system should undergo training.
- System must be user friendly
- System must enable access control rights

### 5.2.3 Hardware Specifications

- Processor: Pentium IV or higher
- RAM 256 or Higher
- Disk Space 1GB
- LAN Ethernet 10/100Mbps card/bus.

### 5.2.4 Software Specifications

- Operating System: Windows 10 or Higher
- Web Browser: Internet Explorer 6 or Higher
- Database: MySQL version 5.0.1 or higher as database
- Runtime Environment: Apache 2.4.54 as web server

### 5.3 Database Design

Microsoft Access design was used to design the database. Microsoft Access is an excellent tool for organizing large amount of data and defining the relationship between the datasets in a consistent and understandable way. Access provides a structure which is flexible enough to

accommodate almost any kind of data. Relationships between the tables were defined by creating special columns (keys), which contain the same set of values in each table. The tables can be joined in different combinations to extract the needed data.

Access database also offered flexibility that enabled redesign and regeneration of reports from the database without need to re-enter the data. Data dictionaries were used to provide definitions of the data used; these included the final data structures for the various tables and their corresponding data fields, description and sizes. The user application programs and interface were developed using PHP, visual studio structured query language (SQL) and MYSQL.

SQL is a language used to create, manipulate, examine and manage relational databases. SQL was standardized in 1992 so that a program could communicate with most database systems without having to change the SQL commands. Unfortunately, one must connect to the database before sending SQL commands and each database vendor has a different interface as well as different extensions of SQL. Though SQL is well suited for manipulating database, it is unsuitable as a general application language and programmers use it primarily as a means of communicating with databases, another language is needed to feed SQL statements to a database and process results for visual display or report generation.

## 5.4 System Modelling

The illustrations below further describe how the system is modelled.

## 5.4.1 Data Flow diagram

*Figure 5: Showing the Data Flow diagram*
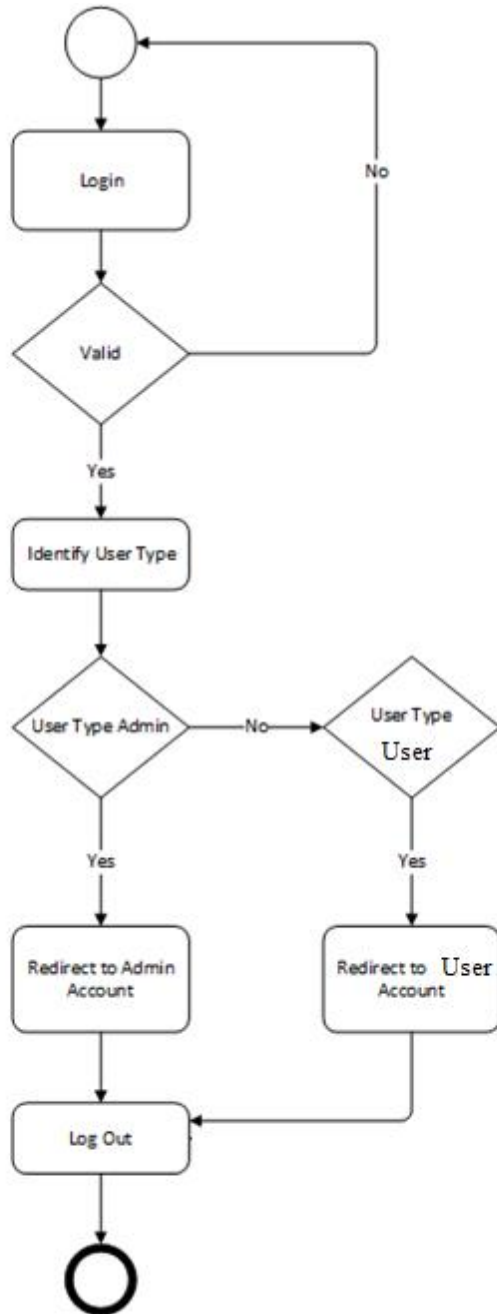
## 5.4.2 Entity Relationship Diagram

*Figure 6: Showing the Entity Relationship Diagram*
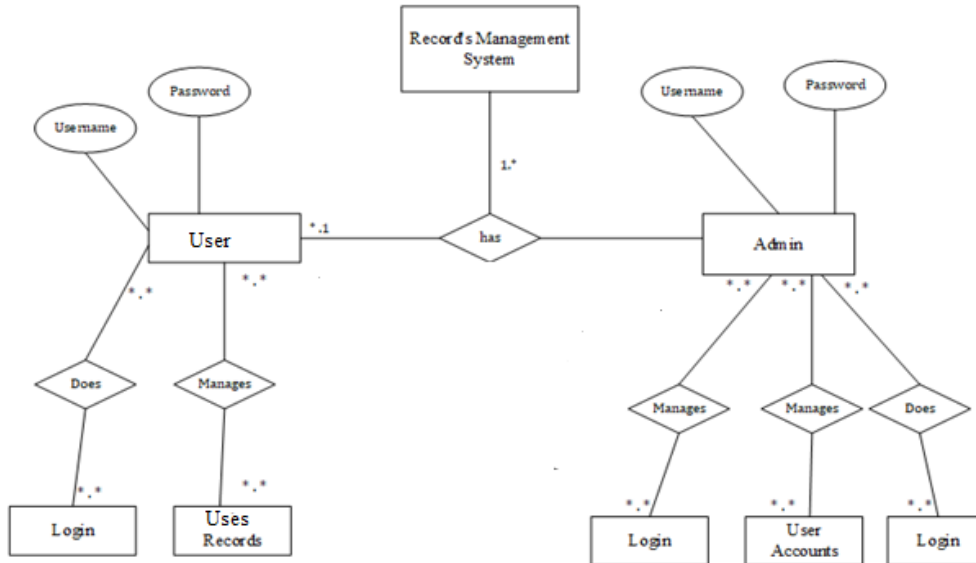


## 5.5 Accessing the System

A user starts the process by logging into the system by means of a valid user/password

combination. A new user has to first be registered in order to obtain access to the system.
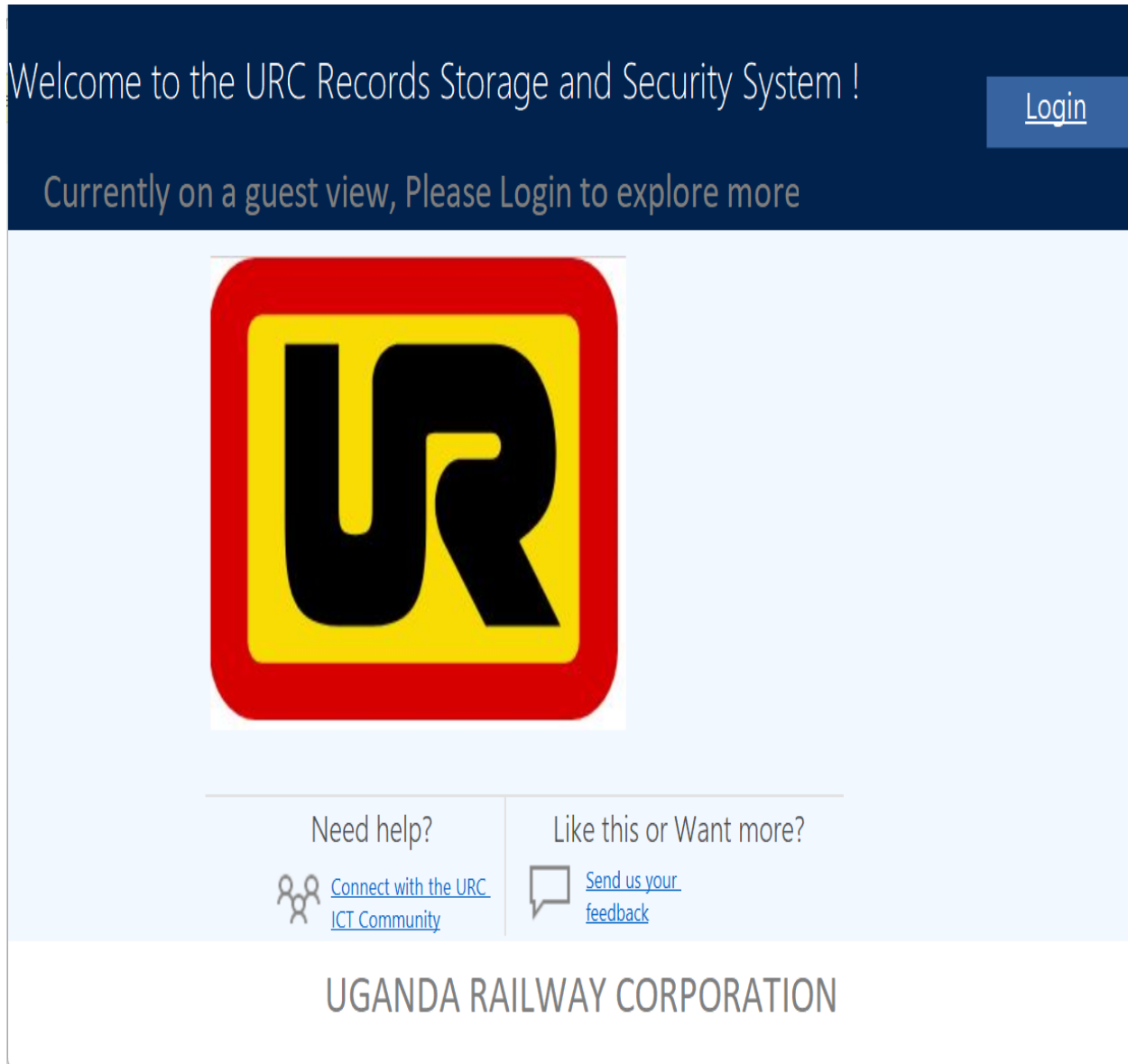
Users with administrative privileges reserve the exclusive authorization to register new system

users. A default administrative account has been provided by the system designers in order to

enable the administrator to access exclusive privileges such as registering new users with either

limited (user) or unlimited (administrative) privileges.

During the process of user registration, all users are issued with a unique user name and password

combination as well as a specific user type (administrator or user). A user gains access to the

system resources after their login combination has been verified as accurate after which they are

redirected to their respective dashboard. The dashboard serves as the gateway to the entire records

management system.

Therefore, once a user is logged into the system, they can access all system resources available to

them based on their privilege level.

Once logged into the system, the user can create, manipulate and truncate records. However, the amount of manipulation that a user can perform with regards to the records is dependent on user privilege levels.

*7: Showing the proposed system Welcome Form*

*Figure 8: Showing The proposed system Login Form*
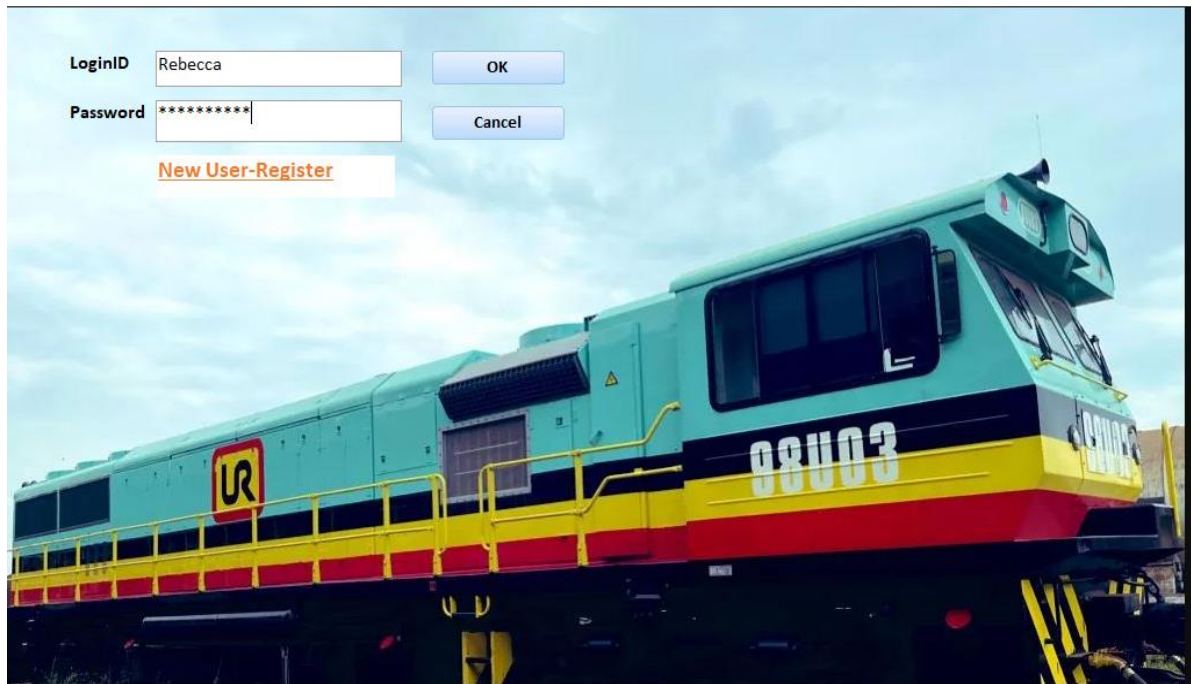


*Figure 9: Showing The user Registration Form*

**Figure 10: showing the files stored in the system**

| | FileNo | Date Range | Department/Unit | Location | Drawer Number |
|---|---|---|---|---|---|
| ⊞ | URC/ADM/100/001 | 2020-2022 | Administration correspondences | Cabinet 001 | 1&2 |
| ⊞ | URC/ENG/500/005 | 2020-2022 | Engineering Reports | Cabinet 003 | 6 |
| ⊞ | URC/FIN/300/003 | 2020-2022 | Financial | Cabinet 001 | 2&3 |
| ⊞ | URC/HR/400/004 | 2020-2022 | Human Resources | Cabinet 002 | 5 |
| ⊞ | URC/IT/700/007 | 2020-2022 | IT Reports | Cabinet 003 | 8 |
| ⊞ | URC/MECH/600/006 | 2020-2022 | Mechanical Reports | Cabinet 003 | 7 |
| ⊞ | URC/PMD/700/007 | 2020-2022 | Personnel Management | Cabinet 003 | 9 |
| ⊞ | URC/STA/200/002 | 2020-2022 | Stakeholders correspondences | Cabinet 002 | 4 |
| * | | | | | |

**Figure 11: showing some of the records in the system**

| ID | FileTitle | DateCreated/Re | FileNo | File_N | Click to Add |
|---|---|---|---|---|---|
| 1 | Operational Regulations letters to the director fc | 05/11/2020 | URC/ADM/100/001 | 001 | |
| 2 | Request for Breakdown Repair Funds | 05/09/2022 | URC/MECH/600/006 | | |
| 3 | Request for Pension and Salary Arrears | 05/02/2021 | URC/PMD/700/007 | | |
| 4 | URC Environmental and Social Impact Statement | 12/10/2021 | URC/ENG/500/005 | | |
| 7 | Ministy of Works Request Letter | 12/06/2020 | URC/STA/200/002 | | |
| 8 | Application letter for Reseach | 28/09/2022 | URC/HR/400/004 | | |
| * (New) | | | | | |

**Figure 12: showing the records form generated**



| ID | FileTitle | Author | DateCreated/Received | FileNo |
|---|---|---|---|---|
| 1 | Operational Regulations letters to the director for Approval | #Name? | 05/11/2020 | URC/ADM/100/001 |
| 2 | Request for Breakdown Repair Funds | #Name? | 05/09/2022 | URC/MECH/600/006 |
| 3 | Request for Pension and Salary Arrears | #Name? | 05/02/2021 | URC/PMD/700/007 |
| 4 | URC Environmental and Social Impact Statement | #Name? | 12/10/2021 | URC/ENG/500/005 |
| 7 | Ministy of Works Request Letter | #Name? | 12/06/2020 | URC/STA/200/002 |
| 8 | Application letter for Reseach | #Name? | 28/09/2022 | URC/HR/400/004 |
| (New) | | | | |

## 5.6 System Implementation

This describes the tools used to implement the graphical user interface and the database. MySQL was used to create and connect relational tables to the database. Visual Studio was used to develop the GUI. PHP was used to process queries and request flash to integrate sounds and interfaces was done to develop the model that meets all the requirements of this system.

## 5.7 Systems Testing and Validation

Testing was done after the system was put in place. This was done in two ways: Implementation and Unit testing was carried out on individual modules of the system to ensure that they are fully functional units. We did this by examining each unit which we checked to ensure that it functions as required and that it adds clients" data and other details and also ensured that this data is sent to the database. The success of each individual unit gave us the go ahead to carryout integration testing. All identified errors were dealt with.

We carried out integration and system testing after different modules had been put together to make a complete system. Integration was aimed at ensuring that modules are compatible and they can be integrated to form a complete working system. For example, we tested to ensure that when a user is logged in, he/she is linked to the appropriate page, and could at the same time access the database. As one of the final specific objectives of this study, validation of the system was very important. Validation of the system was done by comparing it to the questions asked by the users at Uganda Railway Corporation. Most of their answers matched what the system can do.

### 5.7.1 Testing

Testing is critical for a newly developed system as a prerequisite for it being put into an environment where the end users can use it. Exhaustive testing is conducted to ensure accuracy and reliability and to ensure that bugs are detected as early as possible. In the process of designing the RMS, three levels of testing were conducted, namely, unit testing, integration testing and system testing.

### 5.7.1.1 Unit Test

Unit test is where the system is tested partially and independently, component by component, to ensure that particular portion or module is workable within it. In the development of the records management system, each component was tested independently before finally integrating each of them into one system. This test was used by the researchers to verify that every input of data was assigned to the appropriate tables and fields.

Most of the modules were rather similar and therefore required a rather easy reusable testing process. However, the user accounts module accessible to the system administrator was one of the unique components that needed to be carefully tested in the RMS. This involved testing each user access rights. This was necessary to ensure that user privileges did not overlap.

### 5.7.1.2 Integration Test

Integration test is where a combination of several portions or components/sub components of programs are being tested sequentially and continuously. At this stage, all the system components were integrated and a test was based on how they worked together. This involved observing the interaction of the database and the interfaces. After which the system test followed

### 5.7.1.3 System Test

A system normally consists of all components that makeup the total system to function. It is required to ensure the smooth running of the system as a whole, and it should perform as expected and as required. Here, technical and functional testing was performed. The technical testing involved the process of testing the systems compatibility with the hardware, operating system, data integrity in the database and user authorization access rights. Functional testing was also carried out to establish how the system would function in its intended working environment.

### 5.7.1.4 User Acceptance Test

Despite the few constraints, this part of testing was done by the researchers through oral presentation of the system with URC administrators, the system developers also review the system with the intended system users so as to analyse acceptability and usability and also to identify areas that may require modification before the system can fully be commissioned for use.

### 5.8 Implementation

Implementation is a very important aspect in the development of any computerized system, and this also applies to the development of a records management system. Pro-development Implementation usually involves two main steps, these are;

- System Construction: The system is built and tested to make sure it performs as designed.
- Installation: Preparation is made to support the installed system. This involves associated documentation.

### 5.9 System Documentations

System documentation is a crucial aspect of system implementation. It provides a frame of reference with regards to the implementation process. In designing the RMS for Uganda Railway Corporation, the documentation was done is form an integrated FAQ file that users of the system can refer to if they have any challenges as far as using the system is concerned.

In the attempt to evaluate the designed system, it is imperative that the researchers look back at the predefined functionalities, goals and objectives and analyse those in relation to the expectations met by the system. The Records Management System was evaluated based on the set of predefined objectives and expected functionalities it was able to fulfil.

## 5.10 Limitations of the System

Throughout the development of the Uganda Railway Corporation Records storage and Security System, a few areas were overlooked by the researchers. Some of these limitations can be presented as follows;

### Usability

With regard to its use, the system only caters for English speakers. The GUI and associated documentation are in English. This may present a problem for non- English-speaking users

### Accessibility

The users can only get chance to access their electronic records via the system only when they are within the confines of URC premises since it uses stand-alone computers

### Security

The system also does not cater for the automatic back up of the data in the database. This may present a security problem in the event of data loss.

## 5.11 Conclusion

This chapter has described the proposed Records storage and security system for Uganda Railway Corporation.

# CHAPTER SIX

# SUMMARY, CONCLUSION AND RECOMMENDATIONS

## 6.0 Introduction

This chapter presents a summary of findings, conclusions and recommendations of findings. The findings have been based on the study objectives and research questions.

## 6.1 Summary of findings

The summary was based on the study findings generated and received by Uganda Railway Corporation. The types of records included administrative records, financial records, operation record, and Archival and research records.

The study revealed the different way of records storage and security at Uganda Railway Corporation which included Lateral filing, stack-on method and vertical filing. It further revealed that some records are filed in electronic format and are stored in hard drives and flash. The security measures in place include locking of storage areas, installation of fire extinguishers and water alarms, regular back and upgrade of software for records stored and managed electronically.

The research further presented that the Uganda Railway Corporation has faced a lot of challenges that are faced in records management which included missorting, improper indexing, misplacement of records, limited equipment, poor maintenance of the registry, inadequate qualified staff and poor filing methods, poor handling of information, poor folioing and indexing respectively.

The study designed a records storage and security system in access. The database has functionalities like records capture, access restriction, user management and modification of records among others. The study also presented the system modelling process, the testing steps as well as implementation.

## 6.2 Conclusion

In a nut shell, records storage and security is a very important aspect in records management and it's highly recommended to all organizations to promote records management because no organization can exist without generating records. Records provide information which can be used

by administrators, policy makers and all other types of staff members at the Uganda Railway Corporation and therefore they should be well stored and secure from uncertainties.

## 6.3 Recommendations
### Employing qualified staff

Uganda Railway Corporation should employ qualified staff in records affairs go through training on how to store and secure records

### Creating staff awareness on the importance of records

The Uganda Railway Corporation should create staff awareness on the importance of records to the organization since some staff members give no emphasis to the records and leave all the work to be done by registry staff

### Proper handling of information materials

The Uganda Railway Corporation should ensure that its staff members handle all the information materials with care.

### Training of existing staff members

The Uganda Railway Corporation should also ensure training of all existing staff members in the records management field. Most of the challenges have been caused due to lack of enough records management skills therefore training is an urgent measure.

### Proper Indexing of Records

The Uganda Railway Corporation should ensure that all its records are classified following proper indexing. They should make sure they advise all their staff members to index their records properly before classifying and later filing them.

Staff motivation should also be improved upon in terms of salaries and allowances and providing the necessary job tools. Records management work tools include shelves, computers, files, cabinets and scholastic materials.

# APPENDICES

## Appendix I: Introduction letter from EASLIS

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**COLLEGE OF COMPUTING & INFORMATION SCIENCES**
**EAST AFRICAN SCHOOL OF LIBRARY AND INFORMATION SCIENCE(EASLIS)**

September 23, 2022

The Records Officer
Uganda Railways Corporation
P. O. Box 563
Kampala – Uganda

Dear Sir/ Madam,

**RE:    INTRODUCTION LETTER**

This is to introduce to you the following students pursuing a Bachelor's Degree in Records and Archives Management (BRAM Year III) at the East African School of Library and Information Science under the College of Computing & Information Sciences, Makerere University.

1. Anayo Rebecca          19/U/11898/PS
2. Kafuko Keturah         19/U/11985/EVE
3. Namazzi Shadia         19/U/0886
4. Ggingo Martin          19/U/10031/EVE

As part of their degree program, they are entitled to carry out research under the course BRM 3204. The title of their research is *"Developing a Records and Security System at Uganda Railways Corporation"*.

The purpose of this communication is to request you to offer them the necessary assistance required.

Please note that all the information obtained shall be used for academic purposes only.

Sincerely,

Dr. David Luyombya
**HEAD OF DEPARTMENT**
**RECORDS AND ARCHIVES MANAGEMENT**

**Appendix II: Interview guide questions**

**Interview guide**

Introduction

Dear Respondent

We are third year students of Makerere University, East African School of Library and Information Science, pursuing Bachelor of Records and Archives Management. This interview guide is intended to collect data on a topic "Developing a records storage and security system at URC".

The information collected is meant for academic purposes only. We look forward to ensure privacy and confidentiality.

**Section a: data of respondent**

1. Name of respondent
2. Age of respondent
3. Gender of respondent
4. Education background of respondent
5. Number of years in current position
6. Category/ designation of respondent

**Section b: questions**

1. What are the various types or categories of records generated at URC?
2. What records formats do you keep in your organization?
3. What are records storage equipment used in your organization?
4. What are the current records storage practices at URC?
5. What are the records security measures put in place at URC?
6. What are the challenges faced in records storage and security at URC?
7. Does your organization have a records storage and security system?
8. According to you, is it effective and why?
9. What has your organization done to address the above challenges faces at URC?
10. Any other information about Records storage and security that you would like to share with us?

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