TITLE: ONLINE RESEARCH PROJECT MANAGEMENT SYSTEM

CASE STUDY: MUTEESA 1 ROYAL UNIVERSITY

BY

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**A RESEARCH PROPOSAL SUBMITTED TO THE DEPARTMENT OF INFORMATION TECHNOLOGY, FACULTY OF SCIENCE AND TECHNOLOGY IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THEAWARD OF BACHELOR OF INFORMATION TECHNOLOGY OF MUTEESA 1 ROYAL UNIVERSITY**

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# **CHAPTER ONE: INTRODUCTION**

Management of Research Projects is very often a tedious affair. Research projects which are submitted go through not only a complex and tedious process but often the scrutiny of many individuals of different roles. Hence, it is important that any automation envisaged goes through a meticulous exercise to achieve the same. Research project Management System aims to provide an online Research project Management mechanism, improving the traditional and physical methods of Management. Such system allows assignment Management to be more efficient and greater rigor. Online Management provides electronic copy of assignments, which has many benefits over traditional physical copy Management of assignments. With the implementation of Research project Management System, one can be subjected to the same rigor as traditional means without compromising on quality whilst adhering to the same process workflow.

## **1.1 Background**

Traditional paper based submission had introduced various problems to academic staff and students. Online submission provides flexibility for submission regardless of physical location, save up physical space by using electronic copy of submission and ease evaluation process of academic staffs.

Email provides a solution towards Research Project and other documents' submission online. However, organizing submissions in email system is time consuming and inefficient.

Online web content management approach to handle the activities of creation, submission and approval will be more beneficial. Research Projects are widely in use under various occasions. Type of Research Project includesAcademicResearch Project, business Research Projects, etc. In academic field, academic Research Projects are the first step in producing research papers, thesis, or major projects.

A content management system is a database of information and a way to change and display that information without spending a lot of time dealing with the technical details of presentation.

Research Project Management System as an effective media allow users to share and manage information easily through the use of web browsers. Many had utilized the advantages of Research Project Management System in various situations. Organizations use Research Project Management System to store, display, and organize information. Other forms of Research Project Management System include personal blogs, library portals, development wiki and etc.

A Research Project Management System approach for the system allows creation, editing, submission, and approval of Research Project ona website without any need of third party software. The Research Project Management System will also able to track any updates and status of each Research Project, allow notification to be send to related parties.

With the use of Research Project Management System, academic staffs will be able to manage the flow of Research Project submission and approval activities in a more organized manner. Student will go through a proper procedure tocreate a Research Project and this ensure the Research Project consist of all required details before submission forapproval. This provides a consistent format or layout for Research Project submission; ease the evaluation process of academic staff on approval of Research Projects.

## **1.2 Problem Statement**

At Muteesa I Royal University, there is no stop platform for research content and project data management. This makes it difficult for the students to avoid duplication of research topics. Additionally, the search for research matter and references becomes a tiresome process. In order for a student to gather content for their research, they have to navigate a lot of websites looking for references and data. Additionally, students with practical final year projects also find it challenging to identify a research topic that has not been presented in the near previous years. Therefore, there is necessity to avail research content and project data management for the University to ease identification of research topics and create a centralized repository of research material.

## **1.3 Objectives**

Below are the objectives of the study

**Main objective**

To develop a centralized system with a repository composed of a variety of faculty based research material and project data that will ease students’ efforts in the development of their research projects.

**Specific objectives**

1. To analyze the current research project management system
2. To collect data about the current research project management system and justify the need for a digital system
3. To design an online research project management system
4. To test and implement a digital research project management system

## **1.4 Scope of the Study**

The following is the scope of the study

**Content Scope**

The system is able to capture, store, retrieve, reproduce and communicate operational data. Online Research Project Management System.

**Geographical Scope**

The study was carried out at Muteesa 1 Royal University in Masaka City.

**Time Scope**

The study was carried out from July to October 2022 and presents documents covering a period of five years (2017-2022)

## **1.5 Significance of the study**

The study was relevant in the improvement of recording research projects, keeping track of the research projects submitted, storing, adding and deleting of research projects.

The study imparts advanced skills and knowledge to do personal research.

# **CHAPTER TWO: LITERATURE REVIEW**

## **2.1 Introduction**

This chapter seeks to review the available literatures about the information systems and their different classifications and also discusses about databases including their advantages and disadvantages.

## **2.2 Systems**

The term systems as described by Liddell (1940) are derived from a Greek word systema which means an organized relationship among functioning units and components.

In computer science, a system is a set of devices working together to accomplish a specific task. This can include input, output and processing components of a computer and not forgetting humans who act as the system users.

A system is also referred to asa set of devices, procedures and operating systems designed to the user needs to produce information and communicate it to the user for proper planning, control and performance.

**Types of Systems**

Systems have been classified in many ways and the major ones according to Bailey (1994) include:

1. Physical or abstract systems
2. Open or closed systems
3. Information systems

### **2.2.1 Physical or abstract systems**

Physical systems are tangible entities that may be static or dynamic in nature, for instance the physical parts of a computer center are staff, desks and chairs are static in nature that is to say can be seen and counted. In a programmed computer the programs, data and applications change to the users demands and hence are dynamic in nature.

Abstract systems are conceptual entities. These are not physical entities. They may be formulas, representation or model of a real system.

### **2.2.2 Open or closed systems**

The majority of systems are open systems. An open system has many interfaces with its environment. It can also adapt to changing environment conditions.

It can receive inputs from and deliver output to the outside of the system.

An information system falls in this category since it must adapt to the changing demands of the user.

Closed systems are systems that don’t interact with their environment. Closed systems are rare and mostly exist in concept.

### **2.2.3 Information Systems**

An information system is any organized collection, organization, storage and communication of information Valacich(2008).

An information system is the basis of interaction between the user and the system. Its main purpose is to manage data for a particular organization.

It provides instruction, commands and feedback. It determines the nature of relationship among decision makers.

**The major categories of information systems as stated by Catalina (2008) include:**

1. Computer based Information Systems
2. Informal Information Systems
3. Formal Information Systems

**Computer based information systems:**

This class of systems depends on the use of computers for managing business applications.

**Informal information systems:**

These are employee based. They are made to solve day to day issues.

**Formal information systems:**

These are responsible for information flow from top to lower management.

**Decision Support System (DSS)**

According to Sprague (1980) these are information systems that provide strategic information needed by top most management for decision making.

The information is not required by lower levels in the organization.

For example, the trends in revenue earned by the organization are required by the top management for setting the policies of the organization.

**Management Information System (MIS)**

According to Kroenke (2007) these are information systems that provide management information for an organization.

This information can include for example sales analysis for the past quarter or yearly production details.

It provides management with a comprehensive picture of specific operations. To do this job, it should operate in real time, handling inquiries as quickly as they are received. Operationally, the MIS should provide for file definition, file maintenance, updating, transaction and inquiry processing and one or more databases linked to an organizational database. In so doing, data redundancy and time it takes to duplicate data are kept to a minimum, thus insuring that data are kept current at all times.

### **2.2.4 Database Systems**

A database is described by Chapple (2005) as an organized collection of data. It is the collection of schemes, tables, queries, reports, views and other objects. The data are typically organized to model aspects of reality in a way that supports processes requiring information, such as modeling the availability of rooms in hotels in a way that supports finding hotel vacancies.

**Advantages of Database Systems**

1. Reduced data redundancy.
2. Greater data integrity and independence from application programs.
3. Quick and easier to develop due to standardized components.
4. Reduced updating errors and increased consistency.
5. Improved data access to users through use of host and query languages.
6. Reduced data entry, storage and retrieval costs.
7. Facilitated development and new application programs.

**Disadvantages of Database Systems**

1. Database systems are complex, difficult and time-consuming to design.
2. Substantial hardware and software startup costs are incurred.
3. Any damage to the database affects virtually all application programs.
4. Initial training is required for the users to gain skills of how to use the database systems.

**Database Management Systems (DBMS)**

A database management system according to Charles (1973) is a software system that enables users to define, create and maintain the database and that provides controlled access to this database.

A database is a collection of logically related data designed to meet the information needs of an organization. Logically related data comprises entities, attributes and relationships of an organization’s information. Therefore, a database management system (DBMS) is a software application that interacts with the user, other applications and the database itself to capture and analyze data.

The various database management systems include Microsoft access and SQL-server from the Microsoft Company, DB2 from IBM, Oracle and Sybase etc.

**Advantages of Database Management Systems.**

1. A DBMS offers improved security in form of controlled access such as passwords to access data, firewalls.
2. A DBMS provides a backup and recovery for data. Users have backups for reference and prevent total data loss.
3. Restricting access to data is easy. Access can be restricted through changing permissions to enable specific users gain access to specific data.
4. A DBMS provides improved data accessibility and responsiveness. Once a command is placed, the result is immediate. Data can also be queried easing access.

**Disadvantages of Database Management Systems.**

1. Cost of maintaining some DBMS are high. This includes hiring trained people to monitor and maintain the database.
2. The cost of conversion from the old system to the new system may be high.
3. Complexity of the DBMS. Some DBMS are difficult to learn and use and require extensive training.
4. Some DBMS require particular hardware specifications. That leads to cost in buying additional hardware to accommodate any compatibility issues.

## **2.3 Conclusion**

This chapter has discussed the literature about systems, information systems, the different types of information systems. In addition, it has discussed about database systems, Database Management Systems (DBMS), including their advantages and disadvantages. Finally, the chapter concludes with literature about Inventory systems stating their importance and objectives.

# **CHAPTER THREE: RESEARCH METHODOLOGY**

## **3.0 Introduction**

This chapter discusses the methods, techniques and tools that were used in data collection and analysis, system design and development and system implementation, testing and validation.

## **3.1 Research Design**

This study followed the System Development Life Cycle (SDLC) methodology to design the new system. SDLC is also referred to as Application development life-cycle used to describe a process for planning, creating, testing and deploying a system.

The SLDC is the overall process of developing, implementing and retiring information systems through a multistep process from initiation, analysis, design, implementation and maintenance to disposal. There are many SDLC models and methodologies, but each generally consists of a series of defined steps or phases.

Some of the SDLC phases include:

1. Software Requirement Analysis. This involves the feasibility study of the current system to enable requirement gathering.
2. Testing. This involves testing of the already created system for bugs once the code is generated. Different testing tools and methodologies are used.
3. System Modeling. This involves placing the different requirements for the system gathered in order, interfacing the software with the hardware.

## **3.2 Data Collection Methods**

The following methods were used.

## **3.2.1 Interview guide**

The researcher interviewed a number of students at Muteesa 1 Royal University to get their views about results processing and management.

This method was vital to enable the researcher fully understand the people’s experiences with the current system. This method is effective in a way that:

i) It gains a full range and depth of information that one can express all his or her feelings about a subject not like other methods like questionnaire which are close ended.

ii) It creates a relationship between the researcher and stakeholders which is good for further inquiries and references.

## **3.2.2 Document Review Method**

This method involves obtaining past and present documents that show the daily operation and management of the system.

## **3.3 System Development**

The System Development Life Cycle is used because it gives the overall list of processes and sub-processes required for developing a system as shown in its phases. The different phases of the system development life cycle include: System study and analysis, system design and modeling, System implementation and testing, Maintenance and others.

### **3.3.1 System Study and Analysis**

The Purpose of the system study was to get a clear picture of what the physical system was.

The system study involved a detailed study of the various operations performed by the current system and their relationships within and outside the system. During this process, data was collected on the available files and transactions handled by the current system.

System Analysis involved collecting factual data, understanding the processes involved and identifying the problems of the current system. This also involved studying the business processes, gathering operational data, understanding information flow, finding out bottlenecks and evolving solutions for overcoming the weaknesses of the system so as to achieve the organizational goals.

### **3.3.2 System Design and Modeling**

This section describes the flow of data or information between entities and the processes involved before the information reaches the destination which can be a data store or an entity. Context diagrams and Data Flow Diagrams (DFDs).

**Using Data Flow Diagrams (DFDs)**

It is a technique that was developed by Larry Constantine to express the layout of the system and its basic requirements in graphical form to facilitate System designing.

A Data Flow Diagram is useful in the following ways:

1. It shows the flow of data between various functions of the system and specifies how the current system is implemented.
2. It is an initial stage of the design phase that functionally divides the requirement specification down to the lowest level of detail.
3. Its graphical nature makes it a good communicating tool between user and analyst or analyst and system designer.
4. It gives an overview of what data a system processes, what transformations are performed, what data are stored and what results are produced.

There are mainly four components of a Data Flow Diagram and are represented by the symbols as discussed below.

### **3.3.3 System Implementation**

System implementation is a systematically structured approach to effectively integrate software based services or components into the flow of an organizational structure or an individual end-user.

The new system was implemented with a suitable version of software that was placed on computers at each registered pharmacy using a favorable system implementation method.

The System implementation methods that was used was;

**Parallel run**

In this method, both the new and old systems are used hand in hand for a given time span and the old system is retired after adapting to the functionalities of the new system.

### **3.3.4 System Testing and Validation**

The system was tested using pilot run method. In this method, the new system is run with the old data of the organization and results are compared with those of the old system. Testing is done after the new system is 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. The success of each individual unit gave us the go ahead to carry out integration testing. All the identified errors were dealt with.

System validation follows the documentation of user requirements and a test of the system application to ensure that the new system carries out what it is designed to do. An interview guide designed to capture their responses, thoughts, and impressions was availed to users during the validation

## **3.4 Conclusion**

This chapter has reviewed the methods that were used in data collection and data analysis. The chapter has also discussed at the methodology and methods that were used to analyze the current system, design the new system, implement, test, and validate the new system.

# **CHAPTER FOUR: REFERENCES**

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# **CHAPTER FIVE: APPENDICES**

**APPENDIX: INTERVIEW QUESTION GUIDE**

**DATE……………...**

**PERSONAL INFORMATION**

What is your name? .........................................................................................................

Sex F M

What is your nationality? ................................................................................................

What is your age? ............................................................................................................

If student, how do you find the current system?  
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**RESEARCH RELATED QUESTIONS**

What kind of system do you use as a university?

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Is your system secure?

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Are you contented with the current system?

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What is the speed of the current system?

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……………………………………………………………………………………………………………….

What are the loopholes of the system in terms of the following features?

a) Speed ……………………………………………………………………………

b) Security ……………………………………………………………………………

c) Flexibility …………………………………………………………………………...

d) Storage ……………………………………………………………………………

What are the recommendations for the future system in terms of:

Password security ……………………………………………………………………………

User friendliness ……………………………………………………………………………

Feedback when queried ……………………………………………………………………………

Multipurpose to handle many user accounts ………………………………………………….

The following description enables the respondent to give his/her own opinion about the current records management system in the pharmacy.

Comment on how the current system works

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What are some of the merits of the current system?

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Comment on the security of the current system

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Recommend on the features of the new system

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# **6.0 Conclusion**

The Research Project Management System will open up vast amount of possibilities in providing better and more flexible solution with regards to submission of proposals in comparison to traditional approaches. The Research Project Management System as described in this paper uses a content management system approach. The system is adorned with a centralized and seamless console with an array and options for users to maneuver within the system. The system which has been rolled out has benefits in store for both academics and students alike. The system will be highly intuitive and seamless among others to withstand the demands of research projects and its related issues. The developers have put together a well-thought out application which not only automates the manual process but is highly scalable to suit future requirements and other challenges which may arise. It is worth mentioning that the system is not merely automation of manual tasks per se but it addressed concerns plaguing most other manual management mechanisms with regards to compliance with process workflow which the authors feel is one of the major hallmarks of the system.