



FACULTY OF SCIENCE AND TECHNOLOGY

FST RESEARCH PROJECT PROPOSAL

COMPONENTS OF A RESEARCH PROJECT AND REPORT

This section discusses the components of a research Project/Proposal, which include the following chapters and sub-sections/sub-headings.

The research proposal consists of:

Front Page: Title/Topic Page

Preliminary Pages: Include the following (each on its own page).

Declaration Page: where both the student/researcher and supervisor sign

List of Acronyms

Definition of Terms Used (Optional)

Table of Contents

List of Figures (Optional)

List of Tables (Optional)

Chapters One: Introduction

Chapter Two: Literature

Review Chapter Three:

Methodology

References/Bibliography

Appendices (including Research Instruments (Questionnaire, Interview Schedule, etc, if these are to be used), Budget, and Time Line/Schedule

It uses future tense for chapters 1 and 3

Front Page: Title/Topic, author info, partial fulfillment statement (**Title page not numbered**)

Preliminary Pages: Include the following (each on its own page).

Declaration

Approval

Dedication

(Optional)

Acknowledgement

List of Acronyms

Definition of Terms Used

(Optional) Table of Contents

List of Figures

List of Tables

Abstract **(Optional)**

(All these pages should be numbered in **roman system**)

CHAPTER ONE: INTRODUCTION

- 1.0 Introduction/ description of the sector /industry of your study
- 1.2 Background to the Study
- 1.3 Problem Statement
- 1.4 Objectives
 - 1.4.1 General Objective/Purpose
 - 1.54.2 Specific Objectives of the Study
- 1.5 Research Questions
 - 1.5.1 General Research Question
 - 1.5.2 Specific Research Questions
- 1.6 Scope of Study
 - 1.6.1 Subject Scope
 - 1.6.2 Geographical Scope
 - 1.6.3 Time Scope

- 1.7 Significance of the Study
- 1.8 Chapter Summary

CHAPTER TWO: LITERATURE REVIEW

A student is expected to review the literature based on the variables in the Topic/title of the research, conceptual frame work variables and in relation to your objectives or based on theories, models and frameworks underlying your research.

For example, if the Title/Topic is:

An Inventory Control and Management System for Drugs in the Pharmacy Department of a Hospital

The following are sample/possible sub-sections/sub-headings

- 2.1 Introduction
- 2.2 Types of Information Systems
 - 2.2.1 Management Information Systems
 - 2.2.2 Enterprise Information Systems
 - 2.2.3 Decision Support Systems
- 2.3 Inventory Control Systems
 - 2.3.1 Types of Inventory Control Systems
 - 2.3.2 Inventory Control Systems for Hospitals
- 2.4 Database Systems
 - 2.4.1 Advantages of Database Systems
 - 2.4.2 Disadvantages of Database Systems
- 2.5 Database Management Systems
 - 2.5.1 Components of a DBMS
 - 2.5.2 Functions of a DBMS
- 2.6 Comparison of a Database System and an Inventory System
- 2.7 Chapter Summary (Each chapter should be **summarized/concluded**)

CHAPTER THREE: RESEARCH METHODOLOGY

Sample sub-sections/sub-headings for this chapter could be (this concerns the computing disciplines: Computer Science, Information Technology, Information Systems, Computer Engineering, Business Computing, Software Engineering and related disciplines, e.g., Information Sciences).

- 3.1 Introduction
 - 3.2 Research Design (**Optional**)
 - 3.3 Population and Sample Selection (**Optional**)
 - 3.3.1 Sampling Strategy
 - 3.3.2 Sample Size Determination
 - 3.4 Research Instrument Design and Testing (**Optional**)
 - 3.4.1 Reliability Testing
 - 3.4.2 Validity Testing
 - 3.5 Data Collection and Analysis Methods (**Describe only those to be used**)
 - 3.5.1 Interview Method
 - 3.5.2 Questionnaire Method
 - 3.5.3 Document Review Method
 - 3.5.4 Focus Group Method
 - 3.5.5 Experimental Design
 - 3.5.6 Data Analysis Methods (**optional**)
 - (Quantitative (statistical) methods: e.g., SPSS; Qualitative methods: Content Analysis, e.g., Atlas.ti, Nvivo,
- (The following sub-sections should be based on the Systems Development Life Cycle (SDLC) see SAD)**
- 3.6 Systems Study and Analysis Methods (**Describe methods to be used**)
 - 3.6.1 Systems Study Methods
 - 3.6.2 Systems Analysis Methods
 - 3.7 System Requirements and Specification (**Describe methods to be used**)
 - 3.7.1 User Requirements
 - 3.7.2 Functional Requirements
 - 3.7.3 Non-Functional requirements

- 3.7.4 System Requirements
- 3.8 Systems Design and Modeling Methods (**Describe only methods to be used**)
 - 3.5.1 System Design and Modeling Using Entity –Relationship (E-R) Diagrams
 - 3.5.2 System Design and Modeling Using Unified Modeling Language (UML)
 - 3.5.2 System Design and Modeling Using Data Flow Diagrams (DFDs)
 - 3.5.3 System Design and Modeling Using the CISCO Packet Tracer, etc.
- 3.9 System Implementation, Testing and Validation Methods (**Describe only methods to be used**)
 - 3.9.1 System Implementation Method(s)
 - 3.9.2 System Testing Method(s)
 - 3.9.3 System Validation Method(s)
- 3.10 Chapter Summary

REFERENCES/BIBLIOGRAPHY

(Should be written down in alphabetical/ascending order, without numbers/being numbered)

FRONT (TITLE) PAGE AND PRELIMINARY PAGES

The *title/topic* normally appears on what is referred to as the “*front page or title page*” of the project/report, which, in addition to the title/topic, includes the following:

- *Title/Topic:* which should contain and provide sufficient information to the reader to enable him/her make well-informed judgment about the topic, level of study and what will be/was researched on.
- *Author's (researcher's) name*
- *Author's (researcher's) registration number*
- *Author's (researcher's) previous qualification(s) (optional)*
- *Author's contact E-mail and/or Telephone number (optional)*
- *A partial fulfillment requirement statement.*

Sample Front Page/Title Page

**AN INVENTORY CONTROL AND MANAGEMENT SYSTEM FOR DRUGS IN THE
PHARMACY DEPARTMENT OF A HOSPITAL**

CASE STUDY: ABC INTERNATIONAL HOSPITAL

BY NAKATO DARLEN

VU-BIT-2004-0046

CCNA(Aptec)

dnakato@gmail.com

+256-(0)-700 119999

**RESEARCH REPORT SUBMITTED TO THE DEPARTMENT OF COMPUTING AND
INFORMATION SCIENCE, FACULTY OF SCIENCE AND TECHNOLOGY IN
PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF THE
BACHELORS DEGREE IN INFORMATION TECHNOLOGY AND COMPUTING OF
VICTORIA UNIVERSITY**

MAY 2022

APPROVAL

The following text should be on this page:

This is to certify that this research project/report titled: “*An Inventory Control and Management System for Drugs in the Pharmacy Department of a Hospital*” has been carried out under my/our supervision and is now ready for submission to the Examinations Board and Senate of Victoria University.

Signature :..... Date:.....

Dr.....

(Supervisor)

Signature :..... Date:.....

Ms./Mr.....

(Supervisor)

The *preliminary pages* include the following as **headings**, each *on its own page, on top of the page*, and *centered* on that page.

DECLARATION

The following text should be on this page:

I, **Nakato Darlen**, declare that the work presented in this research project/ report is my original work and has not been submitted to any University or Institution of Higher Learning for any academic award. All work from other authors has been fully and properly acknowledged and cited.

Signature :.....

Date:.....

Nakato Darlen

(Researcher)

DEDICATION
(Optional)

You may (optionally) dedicate this to those persons dear and close to you, who have made some sacrifice/contribution towards your academic and/or life success.

ACKNOWLEDGEMENT

You may acknowledge/thank/appreciate all those persons that have helped you with your research or with your studies generally. People who were interviewed, filled the questionnaire (not to be acknowledged individually, but collectively), those who helped you with reading resources, equipment, advice and guidance about the research/studies, the sponsors of your studies, etc., may be acknowledged here.

LIST OF ACRONYMS

Any acronym/abbreviation used should be explained here, e.g.,

CAD	Computer Aided Design
SWOT	Strengths, Weaknesses, Opportunities and Threats
EPC	Event-driven Process Chains
ICT	Information Communication Technology
UCC	Uganda Communication Commission

etc.

DEFINITION OF TERMS USED (Optional)

Terms that have been operationalized in your research should be defined here.

Mobile Application Use Mobile application or information systems use refers to the utilization of mobile technologies to send services to the customers, and receive services from the organization through mobile applications (mainly mobile phones) (Davies, 1986; Davies et al., 1989). In this research, we define mobile application use as the utilization of mobile applications, technologies, etc., by financial institutions or their customers to send or receive services via these mobile applications/technologies, e.g., phones.

E-Learning E Learning refers to the use of information and communication technologies (ICT) in different processes of education to support and enhance learning (Fredericksen et al., 2000; Maeroff, 2004; Leasure et al., 2000). In this research, E-Learning refers to the learning process delivered via online methods and ICT resources rather than the “Chalk-and Talk method”.

LIST OF TABLES

List all the tables that appear in your different chapters on this page. They should be in the format of table of contents. For example:

Table 2.1: Components of a DBMS..... 8

Table 5.1: Data Definitions..... 20

etc.

LIST OF FIGURES

List all the figures that appear in your different chapters on this page. They should be in the format of table of contents. For example:

Figure 2.1: System Development Life Cycle Stages 9

Figure 5.1: Entity-Relationship Diagram..... 25

etc.

TABLE OF CONTENTS

Generate a **Table of Contents** (TOC) from your marked headings and sub-headings, including the **preliminary pages, chapters headings and sub-headings; and appendices.**

Note: Table of Contents, List of Tables and List of Figures are all automatically generated (in MS-Word) if you have marked your **headings, sub-headings** (in the preliminary pages, chapters and appendices), **figure captions** and **table captions**.

ABSTRACT (Optional)

You may (optionally) summarize your research in an abstract which is sort of an **executive summary** of your research. In the **1st paragraph** briefly talk about the **problem** that your research attempted to address and the **purpose** or **main objective**. In the **2nd paragraph** briefly talk about the **methodology and methods** used to address the problem. In the **3rd paragraph** talk about the **major findings or results** (this could be a system developed or any other important findings). In the **4th paragraph** talk about your main **recommendations**.

Note: The Language used is **future tense**, except **recommendations**.

Sample

Abstract

This research (or study) investigated the problem of drug purchasing, storing/keeping and dispensing in hospital pharmacies using ABC Hospital pharmacy as a case study. One of the major problems cited in hospitals pharmacies is that they lack an efficient and effective method of ordering, storing and distributing drugs to the different wards. The main purpose of the study was to develop a drugs inventory system to overcome these problems.

A System Engineering methodology using the System Development Life Cycle (SDLC) approach was used to analyze, design and implement the developed system. Methods of Systems Analysis and Design (SAD) were used to collect and elicit the different requirements and to specify them; as well as collecting other relevant data through interviews, questionnaires, observations and document reading.

One of the major findings of this study was that the developed inventory system can effectively and efficiently track all the drugs in a hospital pharmacy from the point of entry up to the when these drugs are distributed to the different hospital wards. The inventory system can as well help pharmacies know when stocks have gone below the threshold value so that they initiate the ordering process of new consignments of drugs from the medical stores.

This study recommends that pharmacies should use the developed system for proper management of the drugs in their stores.

CHAPTER ONE: INTRODUCTION

Introduction

n

The introduction section briefly overviews what the chapter contains and creates interest for

reading further. It further discusses the sector/industry the study/research is focusing on. The sector could be banking, school, industry or may focus on the social services in the country, etc. The introduction section should provide evidence and conditions of the existing situations to make the reader feel the urgency of the problem and the need to study it, in order solve it.

The introduction section may have any number of paragraphs but should not exceed 1 page. The first paragraph shall normally give an overview of what the chapter contains and the second paragraph should discuss the sector/industry the research is focusing on.

Background to the Study

This section provides evidence and conditions of the existing situations highlighting the gap(s) to make the reader feel the urgency of the problem, the need to study it in order to solve the problem or contribute to its solution. The background gives rationale of the study and briefly interweaves this with some reviews of previous work that has been done on the topic and its current status as research and conceptual problems. If a case has been selected (e.g., company or organization, etc.), the background should be situated within this case in view of the problem being investigated. The background should also focus on the *constructs/variables* of your study which are in the title of your study, where, and if, this is applicable.

Research Problem/Problem Statement/Statement of the Problem

The problem statement is the focal point of the research and is usually stated in one sentence

with a number of paragraphs that give more details or elaboration. In the problem statement you state: something missing in the knowledge-base, something that is wrong, something that needs to be investigated, or existing methods that no longer seem to be working and need to be re- defined, etc..

The problem statement:

- i. Presents the reason behind the study/research, i.e. what will change when this research is done or what would happen if the research is not done.
- ii. Is an existing negative state not absence of a solution.
- iii. Refers to what has been detected and needs a solution in the practical or theoretical world.
- iv. Should clearly state the nature of the problem and its known or estimated magnitude / extent.
- v. Should be concise and brief (not more than 1 page).

General Objective/Aim/Purpose

The objective refers to the general intention/goal of carrying out the study. The research objectives may be split into:

- *General Objective*, and
- *Specific Objectives*.

The general objective may be a general statement which explains what the research intends to accomplish. That is, it refers to the general intention or goal of the research and should spell out what the research is supposed to accomplish. Normally, the general objective has a relationship with the title of the research.

Where the general objectives is too broad, it may be split into sub-objectives (or specific objectives) arising directly from the general objective/purpose/aim of the study.

The general format of an objective (general or specific) is as follows:

The goal of this research is:

To analyze.....

To evaluate

To establish.....

To determine.....

To design.....

Example of general objective/purpose/goal/aim:

The main objective (purpose, goal) of this research was to design a computerized inventory system for the pharmacy department of Gwattiro Hospital so as to track and trace the distributions of drugs to the different wards in the hospital.

Example of specific objectives:

- (i) To study and analyze the strengths and weaknesses of the current inventory system.
- (ii) To determine and specify the requirements of the new inventory system.
- (iii) To design a new inventory system for Gwattiro Hospital pharmacy.
- (iv) To implement, test and validate the new system.

Note:

Give **four (4)** specific research objectives only. **Not more not less.**

Objectives should be:

S.M.A.R.T (Specific, Measurable, Attainable, Realistic, Time-bound)

Specific – short, precise and concise. Communicates very clearly and explicitly the research outcome. Avoids words that can lend it to several interpretations.

Measurable – It is stated in terms of an outcome that can be **observed** and/or **measured**.

It uses active verbs, that **imply action** and which can be **measured** or **observed**, such as:
Attainable – It is **feasible** (can be answered through collection of data) and **manageable** (can be accomplished within the constraints of the available resources, e.g. finances, equipment, manpower, and even time).

Realistic – It has **reasonable level of difficulty**. It should neither be too hard nor simple.

Time-bound – It can be accomplished **within the available time**.

Research Questions

These are investigative questions or assumptions which guide the study. Research questions are stated to **realize the general objective** and **specific objectives**. For each stated objective there should be a corresponding research question. This means that a research question can be split into:

- *General Research Question, and*
- *Specific Research Questions*

Example of general research question:

How can a computerized inventory system for the pharmacy department of Hospital that can track and trace the distributions of drugs to the different wards in the hospital be designed?

Example of specific objectives:

- (i) What are the strengths and weaknesses of the current inventory system?
- (ii) What are the requirements of the new inventory system?
- (iii) How can a new inventory system for Gwattiro Hospital pharmacy be designed?
- (iv) How can the new system be implement, test and validate?

Significance/Importance/Relevance/Justification/Contribution

This refers to the relevance of study in terms of academic contributions and practical use that might be made of the findings. It should reflect on knowledge creation, technological or socio-economic value to the community.

The significance of the study answers the questions:

Why is your study important?

To whom is it important?

What benefit(s) will occur if your study is done?

Scope

The scope provides for the boundary of the research in terms of depth of investigation, content, and sample size, geographical, time frame and theoretical coverage.

The scope may be split into:

□ Content/Subject/Academic Area Scope

Example

This study only looked at the design of a computerized inventory system of the pharmacy department of a hospital. The design was done using dataflow diagrams (DFDs) and it was implemented on a windows platform using tools such as MYSQL, Apache server and php.

□ Geographical Scope

Example:

This study was carried out at Gwattiro Government Hospital, Bweyogerere Town Council, Kira Municipality, Wakiso District.

□ Time Scope

□ Example:

This study looked at documents spanning a period of five years (2009 – 2013) and lasted

for six (6) months (February – July 2014).

CHAPTER TWO: LITERATURE REVIEW

The chapter of literature review or related work describes what has already been done in the area and demonstrates one's understanding of the problem and related issues. It deals with the analysis of existing literature on the subject with the objective of revealing contributions, weaknesses and gaps. In literature review, one attempts to synthesize previous work rather than merely recount what has been done.

Citation (quoting and acknowledging works of other authors) in the literature review should be according to the approved format, i.e., **Harvard, APA, MLA, IEEE/ACM, Chicago** citation system etc.

Note: The recommended citation system for undergraduate research is **Harvard Citation System**.

The following examples illustrate the different citation styles of Harvard Citation System

Service quality refers to(Beckham et al., 2008).

Smith, Johnson and Kelly (2005) define service quality as.....

According to M'Cain (2011), service quality is

The Thesaurus Online Dictionary (2014) defines service quality as.....

Note: All cited authors/works in the main text of the chapters **MUST** appear in the **REFERENCES/BIBLIOGRAPHY** Section normally after the very last chapter in your project/report.

CHAPTER THREE: RESEARCH METHODOLOGY

This is a detailed description of selected methodology and should be presented in unambiguous terms.

The chapter comprises:

The methodology chapter explains how you carried out the research.

In general the methodology is concerned with some of the following:

- i). **Research Design:** which describes the nature and pattern the research followed e.g. whether it was qualitative or quantitative, historical, descriptive survey, experimental or quasi experimental and location (optional), case study, cross-sectional, etc.
- ii). **Description of the Geographical Area :** where population of the study was based (optional).
- iii). **Population and Sample Selection:** Description of the population from which samples were selected (*simple random sampling, cluster sampling, stratified sampling, systematic sampling, quota sampling, purposive sampling, etc.*).
- iv). **Sampling Strategies:** by which the researcher selected representative elements/subjects from the population.
- v). **Research Instrument Design:** explaining which research instruments were used in data collection and how they were designed.
- vi). **Data Collection Methods:** explaining the methods that were used to collect data including instruments and procedures used in the research described. Data is collected using instruments.

Primary

Sources

Data for the research may come from either primary sources or secondary sources. You

may be required to use primary sources of data for your research. Primary sources are works created at the time of an event, or by a person who directly experienced an

event. Primary data is data collected by (you) the researcher.

Methods for collecting, and sources of, primary data include:

▢ *Focus Group*

These are individuals with specialised knowledge on a particular topic. They may include academic specialists, community leaders, etc. These are small (5-15 individuals) and composed of representative members of a group whose beliefs, practices or opinions are sought.

▢ *Telephone Interview/ Personal Interview*

In interviews, information is obtained through inquiry and recorded by enumerators. **Structured interviews** are performed by using **survey forms**, whereas **open interviews** are **notes** taken while talking with respondents. The notes are subsequently structured (interpreted) for further analysis.

As in preparing a questionnaire, it is important to pilot test forms designed for the interviews.

▢ *Mail/Post Questionnaires (may be closed or open-ended)*

In contrast with interviews, where an enumerator poses questions directly, questionnaires refer to forms filled in by respondents alone. This can be handed out or sent by mail and later collected or returned by stamped addressed envelope. This method can be adopted for the entire population or sampled sectors. Questionnaires may be used to collect regular or infrequent routine data, and data for specialized studies.

it is important to pilot test forms designed for the questionnaires.

A questionnaire requires respondents to fill out the form themselves, and so requires a high level of literacy.

▢ *Door-to-Door Survey*

▢ *Mall Intercept*

▢ *Observation*

In practice, observers do not only make direct measurements (observations), but also conduct interviews and surveys using questionnaires.

▢ *Experimental designs*

Secondary Sources

Secondary data is data obtained from already existing sources.

Sources of secondary data include:

- ▢ Textbooks
- ▢ Journal articles, conference papers
- ▢ Review articles and critical analysis essays
- ▢ Biographies
- ▢ Art, photographs, films, maps, fiction, and music
- ▢ Articles about people and events from the past
- ▢ Government documents and public records
- ▢ Newspaper and magazine clippings
- ▢ Diaries, letters, speeches, autobiographies, and witness statements
- ▢ Original hand-written manuscripts

- vii). ***Data Analysis Methods:*** methods that are used to analyze the collected data, e.g. *statistical methods (SPSS) for quantitative data, or content analysis methods for qualitative data.*
- viii) ***Reliability and Validity Research Instruments:*** describes how data quality control was attained, that is, how reliability and validity of data and instruments were measured.
- ix). ***Measurements,*** describes the formulae or scales that were used in the study.
- x). ***Data analysis Methods:*** describes data organization methods used and interpretation of the data generated.

- xi) **Ethical Considerations:** explains how ethical issues related to respondents, their disclosure of information and their acceptance of, or willingness to be used as subjects, etc., were addressed. Ethics of the research here refers to the morals of the investigation or intervention as regards the minimal abuse, disregard, safety, social and psychological wellbeing of the person, community and /or animals i.e. how the principles of consent, beneficence and justice are handled in the study. Include a statement of where ethical clearance has been or will be obtained.

Note:

Since in computing (including computer science, information technology, information systems, computer engineering, software engineering, business computing, information science, etc) we use the **SDLC Approach**

EXAMPLES OF REFERENCES

[Alphabetise Corporate Authors by first significant word of the name. When the author and publisher are identical, use the word author as name of publisher. Note the way editions are written(ed.)]

American Psychological Association. (2010). Publication Manual (6th ed.). Washington, D.C: Author.

Journal article with three to five authors cite all authors in the first textual citations, then subsequent citations may use the surname of the first author followed by et al. (Baker, et al., 1983).

Barker, B.L., Jones, W., Oscar, B. B. & Harris, D. P. (1983). Effect of intertribal delays on retardation of learning. *Journal of Experimental Psychology: Animal Behaviour Processes*, 9, 581-593.

[Magazine articles include month of issue.]

Carver, H.C. Jr. & White, C. (1981, December). Do babies sing a universal song? *Psychology*

Today, pp.70 – 76.

[If only the abstract is used as the source, cite all the collection of abstracts in parentheses at the end.]

Fujita, J.& Misumi, M. (1982). Effects of organisational development in market organisation. *Japanese Journal of Experimental Social Psychology*. 21: 93 – 111. (From Psychological Abstracts, 1982, 68, Abstract No. 11474)

[Edited book, both city of publication (New York), and publisher Praeger listed.]

Grant, S. Jr. & Cannon, C.R. (Eds.), (1960). *Bilingual education: A Whole language approach*. New York; Praeger.

[Several volumes of an edited book. In text, use the parenthetical citation: (Heath & Fraser, 1977 – 1978.)]

Heath, J.G. & Fraser, F.C (Eds.). (1977 - 1978). *Handbook of teratology* (Vols. 1 New York: Plenum Press).

[A Chapter in an edited book].

Merman, A. S. & Kniskern, D.P. (1981). Family therapy outcome. Merman, A.S. & Kniskern, D.P. (Eds.) *Handbook of family therapy* (pp. 742 -775). New York: Avon.

[If a dissertation/thesis does not appear in Dissertation abstracts international, use this format.]

Musisi, J.F.G. (1997). Academic achievement as a function of career guidance. Unpublished masters thesis, Makerere University, Kampala, Uganda.

[Newspaper articles with no author are alphabetized by the first significant word in the title and cited in text with a short title: (PLE Results, 1996)].

PLE results are out. (1996, March 19). *New Vision*, p.1