



NATIONAL OPEN UNIVERSITY OF NIGERIA
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FACULTY OF SCIENCES
DEPARTMENT OF COMPUTER SCIENCE

**GUIDELINES FOR PREPARING AND PRESENTING PROJECTS AND
THESES FOR BOTH UNDERGRADUATES AND POSTGRADUATES IN THE
DEPARTMENT OF COMPUTER SCIENCE**

This guide is aimed to serve as a tool for counseling students on research project and thesis writing. It is equally intended to help undergraduates and postgraduates enrolled in programmes in the Department of Computer Science, prepare and present their projects while conforming to the approved formats.

The guidelines are summarised and presented in three parts, namely: Part A, Part B and Part C.

i. Part A

Part A guides students through the general procedure for undertaking a research project/thesis and presenting their work.

ii. Part B

Part B provides a brief description of each of the main components of a project. It describes the conventions that should govern the preparation and presentation of the content of the report.

iii. Part C

Finally, Part C provides the general structure of the entire project.



PART A

1.0 Introduction

In order to be awarded a Bachelor of Science or a Master of Science degree, a student must undertake, present and pass a project or thesis as the case may be. Thus, the project/thesis can be considered as the culmination of the degree. It offers a student the opportunity to demonstrate what he/she learnt in the taught part of the course. It is essentially intended to assess a student's ability to carry out an investigation in a **systematic** and **scholarly** manner. The project equally tests the student's ability to relay concepts both orally and in writing.

In other words, research project/thesis writing is a detailed exercise that systematically addresses the solution to a specified problem of study. It is essential to note that a project/thesis marks the end of an undergraduate programme, while a thesis marks the end of a Master's programme. Furthermore, the preparation of any of these reports is guided by a format and varies from one field of study or programme, to another. However, the basic components are essentially the same.

2.0 Choice of Project /Thesis Topic

There are many kinds of projects that students can undertake. Some projects present a robust theoretical development, while others show excellence in designing and carrying out an empirical study. A student enrolled in any programme within the Department of Computer Science, is free to choose any project topic, provided the topic is linked to the fields of research related to computer science and information technology, which include: **Architectures, Compiler Optimisation, and Embedded Systems, Cognitive Science, Artificial intelligence, Big data analytics, Modelling and Simulation, Bioinformatics, Data Mining, Databases, Geographical Information Systems, Human-Centred Design (HCD), High Performance Computing. Human Computer Interaction (HCI), Computer Visions and Graphics, Assistive technologies, Gamification, Software engineering and Application Development, Networks, Distributed Systems, Security and Privacy, Digital forensics, Cloud computing, Internet of Things, Mobile applications etc.**



However, it is germane to note that the word “case-study”, should be avoided in the project title. Hence, the focus should be on concepts, not examples.

3.0 Project Proposal

Before embarking on a project, both the student and the supervisor must have a brief meeting (physically or virtually), in order to ensure that the student possesses the capacity and resources to carry out the project work. For this reason, the Department recommends that a student should submit alongside his/her project topic, a corresponding project proposal. The project proposal should be brief (4-5pages), comprising of the outer **title page** as well as the **main project proposal**.

Details of the project proposal are as provided in the subsequent sections.

3.1. Title Page

This should include the provisional title and personal information. The provisional title should be clear and informative. It should indicate the area of study as well as the proposed approach. Basically, the provisional title should not be more than 10 – 15 words. The personal information should include personal details, such as: Name, Matriculation number, Programme, Department, Faculty and University

3.2. The Main Project Proposal

The main project proposal should comprise of the introduction, review of related literature, proposed methodology and references.

i. Introduction

The introduction should include a brief overview of the research topic, the foundational principles, benefits and challenges. The researcher should provide a broad foundation for the problem that led to the study, highlighting the statement of the problem, the aim and objectives as well as the significance of the study.



ii. Review of Related Literature

This entails reviewing a **minimum** of **20** existing works that are recent (not more than 3 – 5 years old) and which are related to the research topic. Journal articles should be mostly sourced. The review should provide an overview of what has been done, and what is yet to be done. Hence, the gap identified in existing literature is a reflection of what has not been done. Ultimately, the research gap gives rise to a clear statement of the problem.

iii. Proposed Methodology

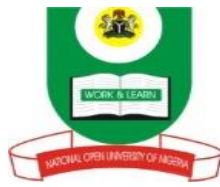
In this section, the methodology to be adopted is specified. A justification of the choice of methodology proposed is equally presented. Hence, the researcher should give valid reasons why the methodology should be employed.

iv. References:

The researcher is expected to prepare a list of books, journals, proceedings, manuals etc. cited in the course of preparing the project proposal. The approved style for referencing is the American Psychological Association (APA) referencing style. The reference should be done alphabetically based on the name of authors.

4.0 Consultation with the Supervisor

The student must consult with his/her supervisor to seek clarifications, report on completed work or problems encountered, etc. Consequently, students are to ensure that they meet regularly with their supervisor, at least every week or every two weeks for a minimum of 5 months. Hence, the supervisor should have a meeting form, that can either be endorsed physically or virtually as the case may be. This will serve as evidence of the student's interaction with his/her supervisor. Unless the student meets the minimum consultation period, which is at least **5** months, the supervisor cannot give approval for the student to submit a project report. A report not approved by the supervisor is a nullity and should neither be submitted nor defended.



5.0 Plagiarism

The Department will not condone cases where students present already completed projects to their supervisors within **2 - 3** months. Hence, the moment a supervisor detects that a student is presenting a work done by someone else; the supervisor must reject the work, as well as caution the student. It is vital to note that students are expected to run a plagiarism check on their work prior to submission, in order to ensure that the similarity index is minimal.

In line with best practice, the Department has adopted the following **maximum tolerable similarity index**:

- a. BSc – 25%
- b. MSc – 20%
- c. PhD – 15%

In view of the foregoing, students should be properly guided on the implications of 'plagiarism, which is an academic offence. Any student who is discovered to have cheated by submitting a copied work, will "Fail" and that student's project will be graded as "F". 'Subsequently, the student will have to re-register the course and start the project report writing from scratch.

6.0 Project/Thesis Submission

Only Students approved by their Supervisors, in writing, should submit their project/thesis. Hence, Supervisors ought to ensure that students sign the attestation page. Supervisors should equally sign their own segment.

7.0 Soft Binding

All students for either project Defence or moderation should submit spiral bound copies of their work, alongside CDs containing soft copies of their work, to their Study Centres. After the moderation or in the case of an MSc. Defence, students should do the necessary corrections before proceeding to bind and submit the hard copies of their bound work. Consequently, **Supervisors must send a consent note acknowledging the corrections done by the students, while the** Study Centres



cross-check and ensure that all the recommended corrections are effected by the student, before re-submission.

8.0 Project/Thesis Defence

In line with the mandate of the National Universities Commission, a student for an Academic Master of Science degree programme shall carry out research in a relevant area of specialisation and submit an acceptable project, which must be defended before a panel of external and internal examiners. The project Defence is an oral examination. This exercise offers students the opportunity to demonstrate their skills and knowledge as well as ownership of their work. It also exposes them to the rudiments of public presentation, which is needed for their prospective career.

In view of the foregoing, all students enrolled in MSc Information Technology, will be required to defend their project work before a panel of Examiners comprising of both internal and external examiners. Each student must ensure that, **prior to the commencement of the project Defence;** their software (developed applications, presentation slides) is fully setup and running on the system to be used for the project Defence. The presentation platform will be PowerPoint. No form of manual writing will be condoned. Furthermore, a supervisor is required to be present while his/her student is defending their project work. Any student that fails to appear after submitting his/her work, shall be treated as absent from that examination.



PART B

1.0 Project/Thesis Report: Technical specification

Content structure

The project report shall comprise of two main sections: sections 1 and 2. These two sections shall comprise of the following elements in the order listed:

1. Preliminary Pages

- a. Cover Page
- b. Title page
- c. Approval
- d. Certification
- e. Dedication
- f. Acknowledgments
- g. Abstract
- h. Table of Contents
- i. List of Figures
- j. List of Tables
- k. List of Abbreviations
- l. Appendices

Each of the elements of the preliminary pages is briefly described for better comprehension.

- a. Cover Page: White blank sheet
- b. Title page: The title page should contain the following details”
 - i. Approved Title of the project report, all capitalized at the upper part of the page
 - ii. Full name of the author,
 - iii. Degree
- c. Approval: After the oral Defence or as the case may be, project moderation the approval page shall be endorsed. This page shall bear a signed statement



by the candidate's supervisor. HOD, External Examiner and Dean of Faculty indicating endorsement by the Department

- d. Certification: Prior to and after the project Defence and moderation exercise, Supervisor(s) must certify that the research work and preparation of project reports were carried out under their supervision.
- e. Dedication: This is optional. Therefore, the author may, if he/ she wishes, dedicate his/her work to any person(s) or corporate body.
- f. Acknowledgments: The author shall acknowledge in his/her own words the support provided by others in the course of carrying out the research work and the preparation of the project report.
- g. Abstract: This is a summary of the entire work. The abstract should be a one paragraph summary and should be between 150 and 250 words. It must be single-spaced and must not be italicised. Ultimately, the abstract should cover the following: background, problem statement, aim, methodology, results and conclusion.
 - I. **Background:** This should give a general introduction of the topic
 - II. **Problem Statement:** This is a declaration of the problem solved in the project/thesis. Note that, it is not necessary to included the problems that were not solved in the work.
 - III. **Aim:** This is the specific goal of the research, in other the objectives.
 - IV. **Methodology:** This entails indicating the scientific approach employed in solving the problem, such as the software engineering technique used, the design method, programming language, data analysis, etc.
 - V. **Results:** Presentation of evidence of the experiment undertaken. Researchers who developed an application should include results of the evaluation or software performance testing
 - VI. **Conclusion:** An overview of what was achieved in the project/thesis. It is pertinent to note that this must agree with the aim of the project/thesis.



- h. **Table of Contents:** This shall contain a list of all major parts of the project report recorded in the order of presentation.
- i. **List of Figures:** This shall contain a complete list of figures such as graphs, diagrams, map etc. in the order in which they appear in project report.
- j. **List of Tables:** This shall contain a complete list of tables in the order in which they appear in the project report. The serial number, title and page on which a table appears shall be given in that order.
- k. **List of Abbreviations:** This entails listing all the abbreviations alongside the corresponding meaning of these abbreviations
- l. **Appendices:** This could include Code Listings, Software documentation, and/or Other Screenshots

2. Main Body

The main body of the project, for both undergraduate and postgraduates shall be in 5 chapters.

Chapter 1: Introduction

1.0 Introduction

Provide the background information on the project work, how and/or why it came to be a matter that is meaningful or useful to work on.

1.1 Statement of problem

Briefly state the exact problem solved in the project work.

1.2 Objectives

List precisely the achievements of the project. These must be verifiable by the Panel. In other words, these objectives must be **SMART**:

- i. **Specific**
- ii. **Measurable**
- iii. **Achievable**
- iv. **Realistic and**
- v. **Time Bound**



1.3 Significance of the study

Tell the use of your project work to humanity, e.g., that it demonstrates the feasibility of using HTML for numerical computation.

Chapter 2: Literature Review

Present the theory of the topic explaining its core or major concepts.

The literature review equally entails reviewing 10-15 existing works that are recent (not more than 5 – 8 years old) and which are related to the research topic. The review should provide a summary of what has been done (related works from books, journals, technical reports, web pages, published manuals, magazines, newspapers, etc. may be cited). The researcher should highlight what is yet to be done. Hence, the gap identified in existing literature is a reflection of what has not been done. Ultimately, the research gap gives rise to a clear statement of the problem.

Chapter 3: Research Methodology

For Chapter 3, the researcher should state the scientific method employed in solving the problem and the justify why that approach was chosen. Ordinarily, more recent and operative methodologies are preferred. In any case, it is difficult to generalise Chapter 3 because it depends on the focus of the project. This guideline presents some typical examples.

- I. It is vital to note that for a researcher who **developed software**, Chapter 3 should comprise of systems analysis and design, while Chapter 4 should include system implementation, software and hardware requirements, systems requirements, testing etc.
- II. On the other hand, for those did a **comparative analysis**, such as: **Genetic Algorithm versus Decision Tree in Malaria Diagnosis**, Chapter 3 ought to comprise of data source, data description, modelling and simulation. While Chapter 4 should comprise of system implementation, software and hardware requirements,



system requirements, etc. It should equally include numerical comparison of the methods and a well-defined metric for measuring performance.

- III. In the case of a researcher carrying out a **numerical research**, such as: **An Improved Stock Rate Prediction Using Genetic Algorithm**, Chapter 3 should encompass data source, data description, modelling and simulation. It should equally include a proposed improvement or modification of an existing formula or a set of equations. Similarly, Chapter 4 should include system implementation, software and hardware requirements, system requirements, etc.

Chapter 4: System Implementation and Testing

Present the architecture of the software you developed, development environment, deployment platform used and a few screenshots of demos.

Chapter 5: Conclusion and Recommendation

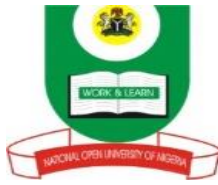
This chapter presents an overview of the work. Note that this section must match your objectives as stated in Chapter 1.

References

This is an entry for each published work cited in the text. Include references for only cited works. The referencing style for the Department has been revised to the **IEEE** referencing style. This referencing style conforms with the referencing style employed in the fields of computing and information technology and shall be adopted by all students of the Department.

Appendices

Place here useful material, e.g., program source code, large tables or figures, long mathematical derivations, questionnaires, that would be awkward or distracting if it appeared in the body of the project report.



General Format of Report

Total size: At **least** 50 pages (word processed)

Paper size: A4

Cover: Hard back, black, gold lettering in Arial font, size 30, single spaced.

Colours: Apart from the lettering on the front cover, *only black and white* colours are allowed in the report.

Approved Colours for Hard Cover Bound Project:

- i. Undergraduate-Sky Blue
- ii. PGD- Navy Blue
- iii. Masters- Black



PART C

Generally, projects/theses in the fields of Computer Science and Information Technology can be broadly classified into application-based research involving software development and research based on numerical or comparative analysis. Thus, the outline for project/thesis writing shall be based on the type of research work being undertaken.

Find attached for your reference, the outline for the application-based research involving software development and research based on numerical or comparative analysis.



Outline for Application-Based Research involving Software Development

The project/thesis report shall be structured as follows:

Cover Page

Title page

Approval

Certification

Dedication

Acknowledgments

Abstract

Table of Contents

List of Figures

List of Tables

Appendices

Chapter 1: **Introduction**

1.0 Introduction

1.1 Background of the study

1.2 Statement of the problem

1.3 Aim of the project

1.4 Specific objectives

1.5 Scope of the project

1.6 Significance of the study



1.7 Definition of terms

1.8 Organisation of the project

Chapter 2: **Literature Review**

2.0 Introduction to the subject area

2.1 Review of Related Literature

2.2 Summary of Reviewed Related Works

Chapter 3: **Research Methodology**

3.1 Design Considerations / Assumptions

3.2 Design / Architecture of the proposed system

3.3 System Algorithm

3.4 Use Case Diagram

3.5 Program Flowchart

3.6 Description of Database

Chapter 4: **System Implementation and Testing**

4.0 System Implementation



4.1 System Requirements

4.1.1 Hardware Requirements

4.1.2 Software Requirements

4.2 Choice of development environment.

4.5 Implementation Architecture.

4.6 System Testing and Evaluation

4.7 Software Testing

4.8 System Change over

Chapter 5: **Summary and Conclusion**

5.0 Summary

5.1 Conclusion

5.2 Recommendations

5.3 Contributions to Knowledge (for MSc Students)

5.4 Future Research

References (IEEE style)

Appendix A: Source code

Appendix B: Any other relevant document

Documentation

User Manual

Source code listing (attach as named appendix



Outline for Numerical or Comparative Analysis Research

The project report shall be structured as follows:

Cover Page

Title page

Approval

Certification

Dedication

Acknowledgments

Abstract

Table of Contents

List of Figures

List of Tables

Appendices

Chapter 1: Introduction

2.0 Introduction

1.1 Background of the study

1.2 Statement of the problem

1.3 Aim of the project

1.4 Specific objectives

1.5 Scope of the project

1.6 Significance of the study

1.7 Definition of terms



1.8 Organisation of the project

Chapter 2: **Literature Review**

2.0 Introduction to the subject area

2.1 Review of Related Literature

2.2 Summary of Reviewed Related Works

Chapter 3: **Research Methodology**

3.1 Theoretical Framework

3.2 Conceptual Framework

3.3 Research Design Methods

(Qualitative/Quantitative)

Sample Size/Population

Research Hypothesis

3.4 Research Instrument

Instrument Validity

Instrument Reliability

3.5 Data gathering Method (Primary/Secondary/Online)

3.6 Data Analysis Methodology (Software/statistical/invivo/reporting)



Chapter 4: **DATA PRESENTATION AND ANALYSIS**

4.0 Data Presentation

4.1 Descriptive Statistics

Demographics/Raw Data Presentation

Tables and Graphs (Visual presentation)

4.2 Inferential Statistics

4.3 Data Analysis (Mathematical/Software)

4.4 Findings

4.5 Interpretation of Findings

4.7 Discussion of Findings

Chapter 5: **Summary and Conclusion**

5.0 Summary

5.1 Conclusion

5.2 Recommendations

5.3 Contributions to Knowledge

5.4 Direction/Suggestion for Future Research

References (IEEE style)

Appendices:

Thanks

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