# INVESTIGATION REPORT (IR) GUIDELINES

**SCHOOL OF COMPUTING (SOC) & SCHOOL OF TECHNOLOGY(SOT)**
**2023**

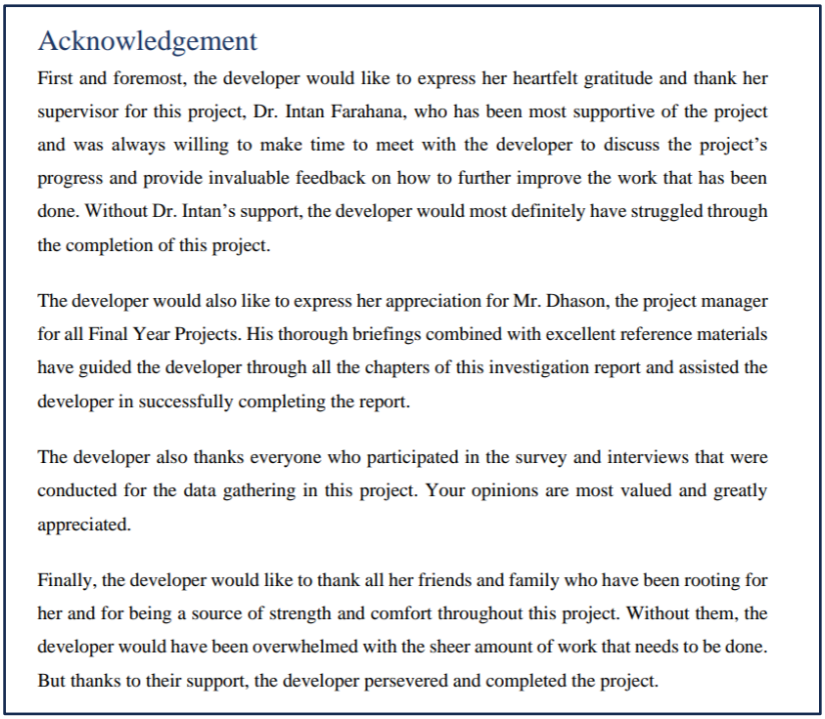
# IR REPORT WRITING GUIDELINES (SOC & SOT)

## COVER PAGE

Please follow the correct format for the cover page that have been prepared. You may find it in the designated folder that have been prepared by your respective FYP managers.

## ACKNOWLEDGEMENT PAGE

This section is written in one page to acknowledge gratitude to contributing persons/parties.



Acknowledgement

First and foremost, the developer would like to express her heartfelt gratitude and thank her supervisor for this project, Dr. Intan Farahana, who has been most supportive of the project and was always willing to make time to meet with the developer to discuss the project's progress and provide invaluable feedback on how to further improve the work that has been done. Without Dr. Intan's support, the developer would most definitely have struggled through the completion of this project.

The developer would also like to express her appreciation for Mr. Dhason, the project manager for all Final Year Projects. His thorough briefings combined with excellent reference materials have guided the developer through all the chapters of this investigation report and assisted the developer in successfully completing the report.

The developer also thanks everyone who participated in the survey and interviews that were conducted for the data gathering in this project. Your opinions are most valued and greatly appreciated.

Finally, the developer would like to thank all her friends and family who have been rooting for her and for being a source of strength and comfort throughout this project. Without them, the developer would have been overwhelmed with the sheer amount of work that needs to be done. But thanks to their support, the developer persevered and completed the project.

*Figure 1: Acknowledgement Sample*

## ABSTRACT PAGE

An abstract section is a one-paragraph summary of a research project. In an abstract it may contain the following information:

- The purpose of the project identifying the area of study to which it belongs.
- The research problem that motivates the project.
- The methods used to address this research problem, document or evidence analysed.
- The conclusion reached or, if the research is in progress, what the preliminary result of the investigation suggest.
- The significance of the project.
- What are the mapping SDG component that can be relate to the project.
- Maximum 6 keywords to be included at the bottom of the abstract.
- Note that the words limit is ***200 words.***

*Abstract*

**Malaysians are at risk of being overweight and obese and the government has acted on this issue by applying several soft and hard policies, however, the result is yet to be known. This study is carried out to predict obesity risk through Body Mass Index (BMI), physical characteristics, lifestyle, and exercise habits for adolescents. Over 800 primary data were collected and went through a preprocessing phase. Naïve Bayes, K-Nearest Neighbors, and Multilayer Perceptron techniques used to build prediction models. The results show that the Naïve Bayes classifier outperformed with an accuracy of 96.67%.**

***Keywords*** **— Body Mass Index (BMI), Obesity, Machine Learning, Naïve Bayes, K-Nearest Neighbors, Multilayer Perceptron**

*Figure 1: Abstract Sample*

**TABLE OF CONTENTS**

Student may refer to the whole structure written in this guidelines to arrange the table of contents.

**LIST OF FIGURES**

Figures include diagrams, photographs, screen shots, graphs, charts, code snippets and etc. Includes title of all figures and the page number where the figure can be found in the text.

**LIST OF TABLES**

Includes title of all tables and the page number where the table can be found in the text.

## MAIN CHAPTERS

## CHAPTER 1: INTRODUCTION

Chapter 1 of the report is an important chapter since it describes the overall project and its outcome. As this is the first chapter that the evaluators will read, it is essential to make a good first impression. It is important to write a chapter that clearly explains the project's flow. A thorough understanding of the ground work is necessary in order to write a well-written chapter. Table 1 shows the outline of Chapter 1.

**CHAPTER 1**

***1.1 Introduction***

***1.2 Problem Background***

- Example: Explain why current technology T is underperforming environment Z.

***1.3 Project Aim***

- A single sentence statement.
- Explaining the key target of the project.
- Example: To develop a system X using technology Y to be employed in environment Z.

***1.4 Objectives***

- A minimum of three objectives and a maximum of four.
- Must be measurable

***1.5 Scope***

- Describes in detail tasks to be executed.
- Constraints regarding any part of the project development (e.g. size of system and technology).
- What will and will not be done as part of the project.

***1.6 Overview of the IR***

- Tangible Benefit
- Intangible Benefit.
- Target User

***1.7 Project Plan***

*Table 1: Outline of Chapter 1*

## CHAPTER 2: LITERATURE REVIEW

In Chapter 2, all the results and findings of the review of literature are presented. Literature review provides a sound basis for a good problem formulation and planning of project. From the literature review, student will be able to build the basic understanding of the project. Table 2.1 shows the outline of Chapter 2 of the report.

**CHAPTER 2**

***2.1 Domain Research***

- Study of domain from general to specific
- Study of Related theories / technology/ algorithm that can contribute towards solving the problems and others.
- Every sub-topic within the domain must have a review

***2.2 Similar Systems/ Works***

- Characteristic of similar systems/ works
- Strength and weakness
- Conclusion

***2.3 Technical Research***

- System requirement analysis
    - Identify the hardware / software for the project and justify

*Table 2: Outline of Chapter 2*

## CHAPTER 3: METHODOLOGY

Methodology describes the overall approach and framework chosen for research and system development. The content for the methodology chapter of the report can hold methods, techniques or approach that is used or will be used during design and implementation of the project.

In addition, this chapter also justifies the choice of methods or approach, as well as hardware and software requirements. It must be noted that the primary objective is not to explain the functions of each phase but rather the process that goes on within in. Table 3.1 shows the outline of Chapter 3 of the report. This outline must be followed, although slight modifications that enhance understanding of the project are accepted.

**CHAPTER 3**

***3.1 System Development Methodology***

- Introduction
- Methodology choice and justification
- Describe the activities and process in each phase towards the chosen methodology (traditional or modern)

***3.2 Data Gathering Design***

- Describe the data gathering techniques choose for the project
    - Surveys
    - Interview
    - Document analysis
    - Observation
    - Other relevant techniques
- Design the questions/event /activities base on the techniques chosen and get verification from the supervisor, through the ***ethic forms***.
- Minimum number or participant to be used:
    - Survey = 30 participants
    - Interview = 3 participants
- *Note that this data gathering activities need to be conducted with the identified target audience and not with your friends.*

- *Note that respondent demographic information are needed to be included in the appendix*

***3.3 Analysis***

- Analysis towards the data retrieve from the data gathering activities.
- Final list of user requirement summarized from the analysis.

*Table 3: Outline of Chapter 3*

## CHAPTER 4: CONCLUSION

This chapter focuses on the concluding remarks of the first part of the Project.

**CHAPTER 4**

4.1 Discuss the achievement of the first part of the project

- Justify were the student able to do enough investigation/ research with regards on what to achieve for the project.
- Justify is there any gaps in the research and design areas that the student may want to further explore and improve.

*Table 4: Outline of Chapter 4*

## REFERENCES

References are detailed description of items from which information were obtained in preparing the project report. Every data, information, quotation, figure, table or anything taken from another source must be cited in the report. Citation must be done within the report and also in the reference list at the end of the report. References shall come from sources such as journals, articles and books. References from internet (i.e. citations from websites) are not encouraged. Student must you the **APA style** for the references (refer to Figure 1).

Abdullah, K. H., Abd Aziz, F. S., Abdullah, N. A. C., Mohd Isa, M. F., & Othman, Z. (2020). Safety Climate and Safety Behavior in the Laboratory among University Students. *Sains Humanika*, *13*(1). https://doi.org/10.11113/sh.v13n1.1771

Adnan, A. H. M. (2020). From interactive teaching to immersive learning: Higher Education 4.0 via 360-degree videos and virtual reality in Malaysia. *IOP Conference Series: Materials Science and Engineering*, *917*. https://doi.org/10.1088/1757-899X/917/1/012023

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Balaji, S., & Murugaiyan, M. S. (2012). Waterfall vs. V-Model vs. Agile: A comparative study on SDLC. *International Journal of Information Technology and Business Management*, *2*(1), 26–30.

Balk, S. A., Bertola, M. A., & Inman, V. W. (2013, October 10). Simulator Sickness Questionnaire: Twenty Years Later. *Proceedings of the 7th International Driving Symposium on Human Factors in Driver Assessment, Training, and Vehicle Design : Driving Assessment 2013*. https://doi.org/10.17077/drivingassessment.1498

Barnard, D. (2019, May 5). *Degrees of Freedom (DoF): 3-DoF vs 6-DoF for VR Headset Selection*. https://virtualspeech.com/blog/degrees-of-freedom-vr

Barsasella, D., Liu, M. F., Malwade, S., Galvin, C. J., Dhar, E., Chang, C.-C., Li, Y.-C. J., & Syed-Abdul, S. (2021). Effects of Virtual Reality Sessions on the Quality of Life, Happiness, and Functional Fitness among the Older People: A Randomized Controlled Trial from Taiwan. *Computer Methods and Programs in Biomedicine*, *200*. https://doi.org/10.1016/j.cmpb.2020.105892

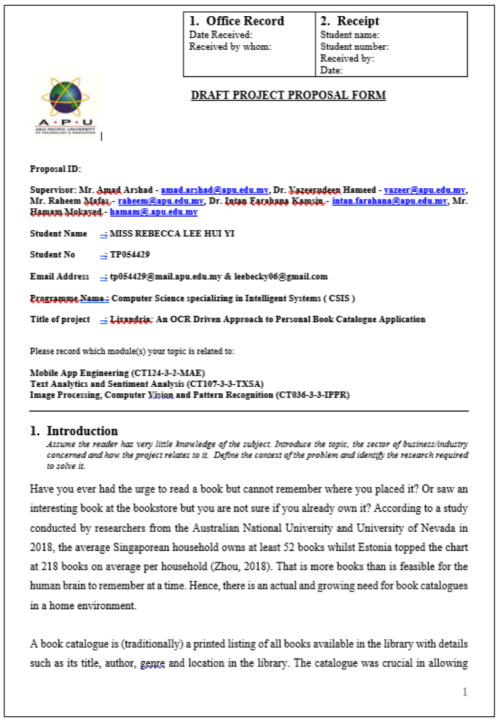
Bednarz, T., James, C., Widzyk-Capehart, E., Caris, C., & Alem, L. (2015). Distributed Collaborative Immersive Virtual Reality Framework for the Mining Industry. In *Machine*

*Figure 1: References Sample*

## APPENDICES

Appendices provide supporting materials that will strengthen the explanation and review of the project. Following is the appendices structure that must be followed.:

- Appendix A: PPF – Title Registration Proposal
    - Student need to include the PPF submitted earlier during the title registration inside the report.



| 1. Office Record | 2. Receipt |
|---|---|
| Date Received:<br>Received by whom: | Student name:<br>Student number:<br>Received by:<br>Date: |

**DRAFT PROJECT PROPOSAL FORM**

**Proposal ID:**

**Supervisor: Mr. Amad Arshad - amad.arshad@apu.edu.my, Dr. Vazeerudeen Hameed - vazeer@apu.edu.my, Mr. Raheem Mafas - raheem@apu.edu.my, Dr. Intan Farahana Kamsin - intan.farahana@apu.edu.my, Mr. Hamam Mokayed - hamam@apu.edu.my**

**Student Name** : MISS REBECCA LEE HUI YI

**Student No** : TP054429

**Email Address** : tp054429@mail.apu.edu.my & leebecky06@gmail.com

**Programme Name :** Computer Science specializing in Intelligent Systems ( CSIS )

**Title of project** : Lixandria: An OCR Driven Approach to Personal Book Catalogue Application

Please record which module(s) your topic is related to:

**Mobile App Engineering (CT124-3-2-MAE)**
**Text Analytics and Sentiment Analysis (CT107-3-3-TXSA)**
**Image Processing, Computer Vision and Pattern Recognition (CT036-3-3-IPPR)**

**1. Introduction**

*Assume the reader has very little knowledge of the subject. Introduce the topic, the sector of business/industry concerned and how the project relates to it. Define the context of the problem and identify the research required to solve it.*

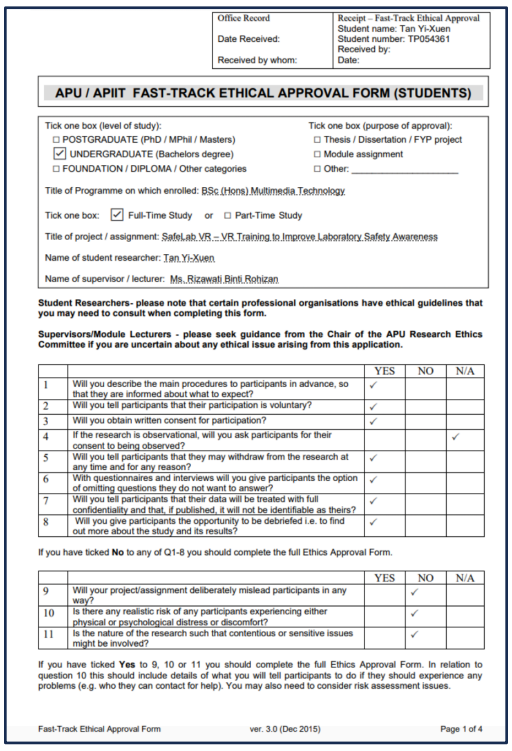
Have you ever had the urge to read a book but cannot remember where you placed it? Or saw an interesting book at the bookstore but you are not sure if you already own it? According to a study conducted by researchers from the Australian National University and University of Nevada in 2018, the average Singaporean household owns at least 52 books whilst Estonia topped the chart at 218 books on average per household (Zhou, 2018). That is more books than is feasible for the human brain to remember at a time. Hence, there is an actual and growing need for book catalogues in a home environment.

A book catalogue is (traditionally) a printed listing of all books available in the library with details such as its title, author, genre and location in the library. The catalogue was crucial in allowing

1

*Figure 2: PPF Sample*

- Appendix B: Ethics Forms ( Fast Track / Full Track)
  - The ethics form submitted earlier in the Moodle for the use of acquiring approval towards the data gathering design need to be included in the report.



| Office Record | Receipt – Fast-Track Ethical Approval |
|---|---|
| Date Received:<br>Received by whom: | Student name: Tan Yi-Xuen<br>Student number: TP054361<br>Received by:<br>Date: |

**APU / APIIT FAST-TRACK ETHICAL APPROVAL FORM (STUDENTS)**

Tick one box (level of study):
☐ POSTGRADUATE (PhD / MPhil / Masters)
☑ UNDERGRADUATE (Bachelors degree)
☐ FOUNDATION / DIPLOMA / Other categories

Tick one box (purpose of approval):
☐ Thesis / Dissertation / FYP project
☐ Module assignment
☐ Other: _____

Title of Programme on which enrolled: BSc (Hons) Multimedia Technology

Tick one box: ☑ Full-Time Study or ☐ Part-Time Study

Title of project / assignment: SafeLab VR – VR Training to Improve Laboratory Safety Awareness

Name of student researcher: Tan Yi-Xuen

Name of supervisor / lecturer: Ms. Rizawati Binti Rohizan

**Student Researchers- please note that certain professional organisations have ethical guidelines that you may need to consult when completing this form.**

**Supervisors/Module Lecturers - please seek guidance from the Chair of the APU Research Ethics Committee if you are uncertain about any ethical issue arising from this application.**

| | | YES | NO | N/A |
|---|---|---|---|---|
| 1 | Will you describe the main procedures to participants in advance, so that they are informed about what to expect? | ✓ | | |
| 2 | Will you tell participants that their participation is voluntary? | ✓ | | |
| 3 | Will you obtain written consent for participation? | ✓ | | |
| 4 | If the research is observational, will you ask participants for their consent to being observed? | | | ✓ |
| 5 | Will you tell participants that they may withdraw from the research at any time and for any reason? | ✓ | | |
| 6 | With questionnaires and interviews will you give participants the option of omitting questions they do not want to answer? | ✓ | | |
| 7 | Will you tell participants that their data will be treated with full confidentiality and that, if published, it will not be identifiable as theirs? | ✓ | | |
| 8 | Will you give participants the opportunity to be debriefed i.e. to find out more about the study and its results? | ✓ | | |

If you have ticked **No** to any of Q1-8 you should complete the full Ethics Approval Form.

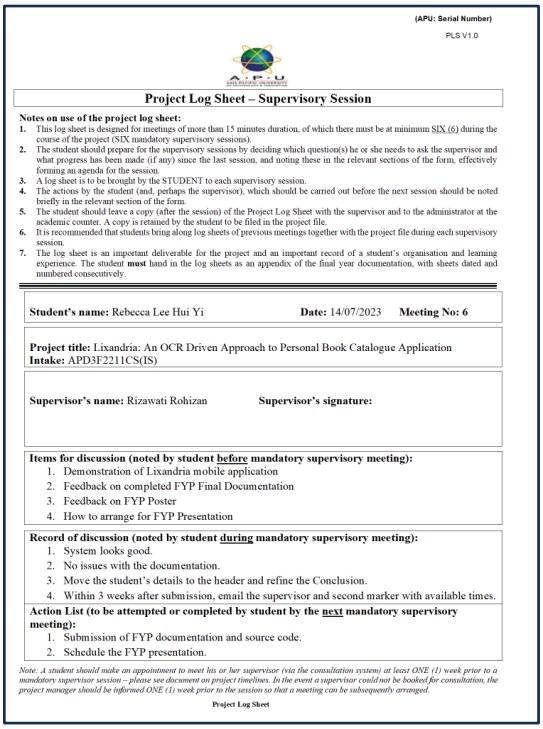
| | | YES | NO | N/A |
|---|---|---|---|---|
| 9 | Will your project/assignment deliberately mislead participants in any way? | | ✓ | |
| 10 | Is there any realistic risk of any participants experiencing either physical or psychological distress or discomfort? | | ✓ | |
| 11 | Is the nature of the research such that contentious or sensitive issues might be involved? | | ✓ | |

If you have ticked **Yes** to 9, 10 or 11 you should complete the full Ethics Approval Form. In relation to question 10 this should include details of what you will tell participants to do if they should experience any problems (e.g. who they can contact for help). You may also need to consider risk assessment issues.

Fast-Track Ethical Approval Form ver. 3.0 (Dec 2015) Page 1 of 4

*Figure 3: Ethics Form – Fast Track Sample*

- Appendix C: Log Sheets ( 3 log sheets)
    - This log book need to be used by the student for the purpose in documenting the meeting with the supervisor on regards of the project progress.
    - It is the responsibility of the student that this log book is kept up to date and that the student complies with the Supervisor's suggestions and recommendations as noted by the student in the log book and approved be signed by the Supervisor.
    - Student **MUST** makes a regular meeting with a supervisor with a **minimum** number of meeting are **3 meetings** per semester.
    - This log book has to be submitted together with the report as well uploaded in the required link inside the Moodle. Below are the example of the project log sheet.



(APU: Serial Number)

PLS V1.0

**Project Log Sheet – Supervisory Session**

**Notes on use of the project log sheet:**

1. This log sheet is designed for meetings of more than 15 minutes duration, of which there must be at minimum SIX (6) during the course of the project (SIX mandatory supervisory sessions).
2. The student should prepare for the supervisory sessions by deciding which question(s) he or she needs to ask the supervisor and what progress has been made (if any) since the last session, and noting these in the relevant sections of the form, effectively forming an agenda for the session.
3. A log sheet is to be brought by the STUDENT to each supervisory session.
4. The actions by the student (and, perhaps the supervisor), which should be carried out before the next session should be noted briefly in the relevant section of the form.
5. The student should leave a copy (after the session) of the Project Log Sheet with the supervisor and to the administrator at the academic counter. A copy is retained by the student to be filed in the project file.
6. It is recommended that students bring along log sheets of previous meetings together with the project file during each supervisory session.
7. The log sheet is an important deliverable for the project and an important record of a student's organisation and learning experience. The student **must** hand in the log sheets as an appendix of the final year documentation, with sheets dated and numbered consecutively.

**Student's name:** Rebecca Lee Hui Yi **Date:** 14/07/2023 **Meeting No: 6**

**Project title:** Lixandria: An OCR Driven Approach to Personal Book Catalogue Application
**Intake:** APD3F2211CS(IS)

**Supervisor's name:** Rizawati Rohizan **Supervisor's signature:**

**Items for discussion (noted by student before mandatory supervisory meeting):**

1. Demonstration of Lixandria mobile application
2. Feedback on completed FYP Final Documentation
3. Feedback on FYP Poster
4. How to arrange for FYP Presentation

**Record of discussion (noted by student during mandatory supervisory meeting):**

1. System looks good.
2. No issues with the documentation.
3. Move the student's details to the header and refine the Conclusion.
4. Within 3 weeks after submission, email the supervisor and second marker with available times.

**Action List (to be attempted or completed by student by the next mandatory supervisory meeting):**

1. Submission of FYP documentation and source code.
2. Schedule the FYP presentation.

*Note: A student should make an appointment to meet his or her supervisor (via the consultation system) at least ONE (1) week prior to a mandatory supervisor session – please see document on project timelines. In the event a supervisor could not be booked for consultation, the project manager should be informed ONE (1) week prior to the session so that a meeting can be subsequently arranged.*

Project Log Sheet

*Figure 4: Project Log Sheet Sample*

- Appendix D: Gantt Chart
    - Student should include the timeline of the semester in completing the project part 1 (IR).

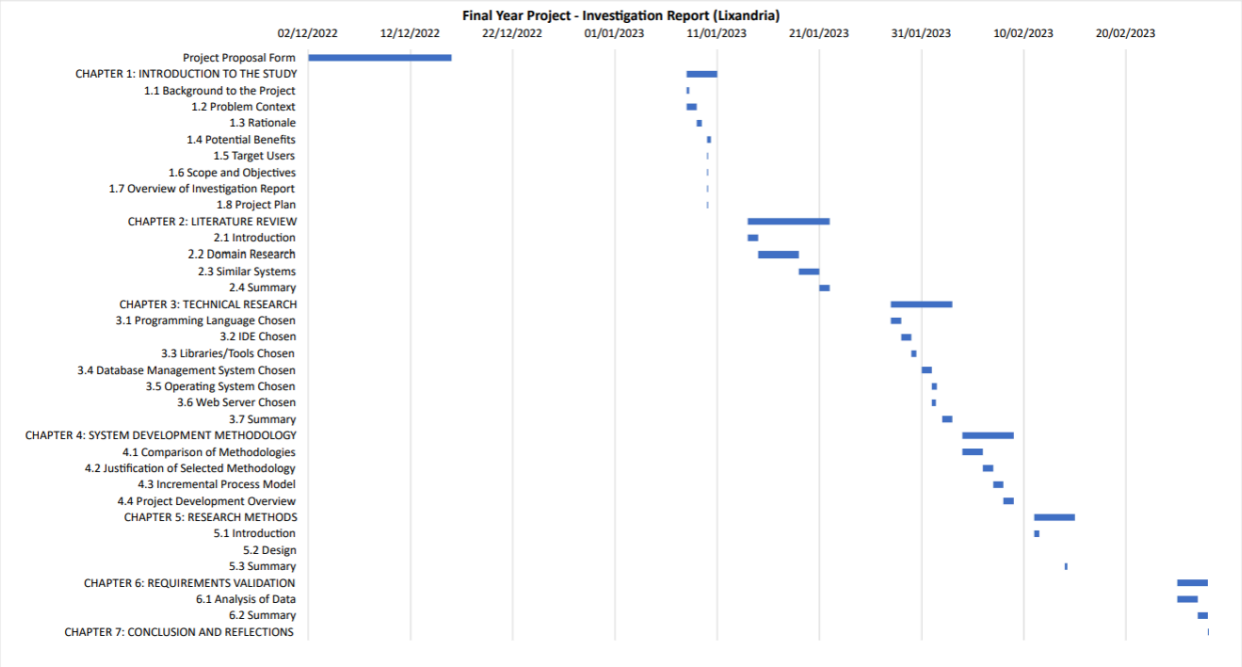



*Figure 5: Gantt Chart Sample*

- Appendix E: Respondence Demographic Profile
    - This section provides information about the respondents (participants) who participate in the data collection process

| **Participant** | **Gender** | **Age** | **Occupation** |
|---|---|---|---|
| Joanne | Female | 30 - 45 | Admin |
| Simon | Male | 25 - 30 | Unemployed |
| John | Male | 30 - 45 | IT Executive |
| Jacqueline | Female | 45 - 54 | Programmer |
| Maria | Female | 30 - 45 | Housewife |

*Note: the name of the participant can be pseudonyms and not the actual name in protecting the confidentiality*

*Table 5: Respondence Demographic Profile Example*