

# Bachelor Project Writing Guide

## *Panduan Penulisan Projek Sarjana Muda*

[ version 2019 ]

### **JAWATANKUASA PSM & PD 2019**

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# **PART I : GENERAL GUIDELINES FOR REPORT WRITING**

**[ ENGLISH VERSION ]**

## **CHAPTER 1. GENERAL GUIDE TO WRITING A REPORT**

### **1.1 Introduction**

This handbook is a reference material for students in Faculty of Information and Communications Technology, Universiti Teknikal Malaysia Melaka. The revisions will be made in view of the current changes and needs especially on the method of providing a good scientific writing presentation considering the requirements of the regulation of study at UTeM and the rapid development of information technology and computer. Revisions will be made based on suggestions and recommendations by Faculty Academic Committee and Final Year Project (Bachelor project) Committee. A number of important relevant documents have been referred by the Final Year Project (FYP) Committee during the initial preparation of this guidance document.

The guidelines contained in this book are for use by UTeM students who need to prepare scientific reports / studies / research projects to meet the requirements of the Bachelor's Degree or FYP. The discussion in this whole guide also uses the word "report" for the purpose of scientific writing for the FYP (Bachelor Project).

### **1.2 Meaning of Report**

The term "report" in this manual is described in INTRODUCTION in the Section 1.1.

### **1.3 Report Structure**

The report contains several sections arranged in the order as displayed in Table 1.1



Table 1.1: Structure and sequence of report content

Sections	Items	Status	Appendix	Items
–	Front cover of the report	Required	A	<ul style="list-style-type: none"> <li>✓ Does not have a page number</li> <li>✓ Left margin: 4.0 cm</li> <li>✓ Right margin: 2.5 cm</li> <li>✓ Top/bottom Margin: 2.5 cm</li> <li>✓ Font size: 12 pt.</li> <li>✓ Font type: Times New Roman</li> </ul>
1.4	Report Status Verification Form	Required	B	Unnumbered
1.5	Title Page	Required	C	<ul style="list-style-type: none"> <li>✓ Page number - Small Roman number (i)</li> <li>✓ Margin left: 4.0 cm</li> <li>✓ Margin right: 2.5 cm</li> <li>✓ Top/bottom margin: 2.5 cm</li> <li>✓ Font size: 12 pt.</li> <li>✓ Font type: Times New Roman</li> </ul>
1.6	Declaration Page	Required	D	<ul style="list-style-type: none"> <li>✓ Page number - Small Roman number</li> <li>✓ Font size: 12 pt.</li> <li>✓ Same margin size as Title Page</li> <li>✓ Font type: Times New Roman</li> </ul>
1.7	Dedication Page	Optional	E	<ul style="list-style-type: none"> <li>✓ Page number - Small Roman number</li> <li>✓ Font size: 12 pt.</li> <li>✓ Font type: Times New Roman</li> </ul>
1.8	Acknowledgement Page	Optional	F	<ul style="list-style-type: none"> <li>✓ Page number - Small Roman number</li> <li>✓ Font size: 12 pt.</li> <li>✓ Font type: Times New Roman</li> </ul>
1.9	Abstract & Abstrak Page	Required	G	<ul style="list-style-type: none"> <li>✓ Page number - Small Roman number</li> <li>✓ Has two versions - English and Bahasa Malaysia</li> <li>✓ Has the same margin size as Title Page</li> <li>✓ Font size: 12 pt.</li> </ul>
1.10	Table of Contents Page	Required	H	<ul style="list-style-type: none"> <li>✓ Page number - Small Roman number</li> <li>✓ Has the same margin size as Title Page</li> <li>✓ Font size: 12 pt.</li> </ul>

1.11	List of Tables Page	Required	I	<ul style="list-style-type: none"> <li>✓ Page number - Small Roman number</li> <li>✓ Has the same margin size as Title Page</li> <li>✓ Font size: 12 pt.</li> </ul>
1.12	List of Figures Page	Required	J	<ul style="list-style-type: none"> <li>✓ Page number - Small Roman number</li> <li>✓ Has the same margin size as Title Page</li> <li>✓ Font size: 12 pt.</li> </ul>
1.13	List of Symbols / Abbreviations / Nomenclature / Terminology Page	Required	K	<ul style="list-style-type: none"> <li>✓ Page number - Small Roman number</li> <li>✓ Has the same margin size as Title Page</li> <li>✓ Font size: 12 pt.</li> </ul>
1.14	List of Attachments Page	Required (If there is an attachment)	L	<ul style="list-style-type: none"> <li>✓ Page number - Small Roman number (if available)</li> <li>✓ Has the same margin size as Title Page</li> <li>✓ Font size: 12 pt.</li> <li>✓ Font type: Times New Roman</li> </ul>
1.15	Text / Report Content	Required	M	<ul style="list-style-type: none"> <li>✓ Page number - Numerical values and starting with number 1</li> <li>✓ Font size: 12 pt.</li> <li>✓ Font type: Times New Roman</li> <li>✓ Contents are based on programme - refer to the FYP Writing Guide</li> </ul>
1.16	References Page	Required	S	<ul style="list-style-type: none"> <li>✓ Page number - Numerical values are contiguous from the text</li> <li>✓ Font size: 12 pt.</li> <li>✓ Font type: Times New Roman</li> <li>✓ Refer to the Reference Writing Guide for reference format</li> </ul>
1.17	Attachments Page	Optional	-	<ul style="list-style-type: none"> <li>✓ Page number - Numerical values are contiguous from the text</li> </ul>

#### 1.4 Approval of Supervisor

The approval of supervisor has to be obtained first before the submission of report for examination. Examples of Supervisor's approval can be found in **Appendix B**.

## 1.5 Title Page

Title page must have the information arranged in the following order:

- ✓ Full title of report;
- ✓ Full name of author as indicated on identity card or passport (international);
- ✓ The report's purpose statement
- ✓ Name of the Faculty / Institute / Centre where the author is registered;
- ✓ University Name; and
- ✓ Years submitted (if the examination result requires the report to be revamped and re-submitted for the second time examination, then the year of submission shall be used)

The above information should be written using Times New Roman font size 12 pt. In addition, the Title Page must have a report purpose statement. It is a statement about the purpose of the report provided. Refer to **Appendix C** for the example of the Title Page along with the report's purpose statement.

## 1.6 Declaration Page

The declaration page contains recognition of the authenticity of the report. It should be signed by the author i.e. student and supervisor of bachelor project. Examples of declaration pages can be referenced in **Appendix D**.

## 1.7 Dedication Page (Optional)

Statement of dedication should be concise, that is not more than one paragraph and does not contain any number, chart or picture. Refer to **Appendix E** for the example of the Dedication Page.

## 1.8 Acknowledgement Page (Optional)

This page should be written in one page only. Acknowledgement is recorded to individuals or organizations that have provided any assistance in the preparation of the report. Refer to **Appendix F** for sample Acknowledgement Page.

## 1.9 Abstract & Abstrak Page

Abstract should be written in two languages i.e. English and followed by its translation in Bahasa Melayu on the next page. Abstracts should be concise, written in one spacing and justification and

not more than 300 words in a single page. Abstract is not the same as synopsis or report summary. Abstracts are written with one paragraph. It should briefly state the field of report studies, problems to be solved, solutions, research processes; and the results obtained. For writing made in English, the abstract should be in that language and followed by its translation in Bahasa Melayu. Refer to **Appendix G** for the example of Abstract.

### **1.10 Table of Contents Page**

The content page should be started on the new page and contains a list of the structures contained in the report, namely Section, Chapter and the main breakdowns of the chapters. The report content is based on the programme. Refer to "PART II: BACHELOR PROJECT CONTENTS GUIDE" to find out the contents of the final report and **Appendix H** to write a report content page format.

### **1.11 List of Tables Page**

This list contains all the table titles that are loaded in the report. The page number placed on the table should be listed in this list. Table number sequences should be made in chapters. Refer to **Appendix I** for sample Table List page.

### **1.12 List of Figures Page**

Diagrams include diagrams, photographs, drawings, graphs, charts and maps. Same as the list of tables, page numbers and diagrams placed should be made in chapters. Refer to **Appendix J** for the Example List page.

### **1.13 List of Symbols / Abbreviations / Nomenclature / Terminology Page**

This page lists symbols or abbreviations or nomenclature or terms found in text. The sequences of the order are as follows:

- Roman letters - alphabetical
- Greek letters - alphabetical
- Superscript - follow the alphabet
- Subscripts - follow the alphabet

Refer to **Appendix K** for the example of list of symbols.

### **1.14 List of Attachments Page**

The report does not necessarily contain attachments. Where necessary, research data, tables, sample surveys, maps, photographs and so forth that are too long to be included in the text or are not needed directly to clarify the matters discussed in the text may be included in the appendix. Attachments can be named as Appendix A, Appendix B and then relate to the type and quantity of materials included as attachments. Attachments can also be given specific titles. Refer to **Appendix L** for an example list of attachments.

### **1.15 Text / Report Content**

The text in the report should contain chapter's title and each title shall reflect the contents. Each chapter should be started on a new page. Chapters can be broken into sections title. The title and subtitle of the chapter must be numbered. Refer to **Appendix Q** for an example of main texts.

The text is written in paragraphs. Avoid writing long paragraphs. Each paragraph should describe one issue or matter and there should be continuity between one paragraph and another paragraph.

The text should include:

- i) Introduction and background of research;
- ii) Detailed description of the study carried out includes theories, models, materials and methods used;
- iii) Analysis, design and development of prototype solutions as well as solutions for test methods and findings; and
- iv) Summary or conclusions and findings implications (findings).

#### **1.15.1 References in the Text**

When information or ideas or queries are taken from a source, the author should state it in the text. References in this text should be written in one of the methods set out in Chapter 3.

#### **1.15.2 Quotes in the Text**

Quotes in the text should be written in separate paragraphs. Quotes written in other languages should use the italics. Examples of how to write citations are given in **Appendix M**.

### 1.15.3 Tables in the Text

The table displayed on the text must be numbered with numerical values. Each table is given a title that is placed above the table at a spacing of a row and bolded. The table number should be associated with the chapter (Example Table 4.3 for the 3rd table in Chapter 4). See the example in **Appendix N**. The table is best placed right after being referred for the first time in the text. Otherwise, tables should be collected in one suitable place. All tables should be listed on the page. The example of the list of tables is shown in **Appendix I**.

### 1.15.4 Figures in the Text

Illustrative materials such as maps, charts, drawings, graphs, diagrams and photographs are called "Figures". Each diagram should be clear and of high quality and given the numerical values. The title of the figure is placed under the illustration material at a spacing of one line and the letter is bolded. The figures should be related to the chapter (Examples of Figure 4.3 for the 3rd figure in Chapter 4). See examples in **Appendix O**.

The Figure is best placed after being referred for the first time in the text. Otherwise, the figure should be collected in one suitable place. All figures should be listed in the Figure List page as in **Appendix J**.

Illustration materials in the form of floppy disks, slides or the like should be loaded in a specially made pocket and placed on the inside of the back cover. Illustrative materials in the form of plans, maps, charts, graphs and so on are to be minimized to fit into one page. Certain illustrative materials shall meet the following requirements:

- **Photographs** - Photographs used as illustrated materials should be attached in text by using a high quality glue or better method.
- **Press clippings and others** - Attach clear and high-quality copy only.
- **Map and Aerial Photographs** - Maps and aerial photographs to be displayed on the report should have the written permission of the Director General of National Mapping. Application must be made using the PPN form 14 available from the Library. See the example in **Appendix P**.

With the latest computer technology, illustrative materials should be recorded using scanners and printed using high quality colour printers.

## **1.16 References**

References are the referencing materials when preparing the report. Authors are reminded to list the material referenced in the text after reference page. This list is in accordance with one of the methods given in Chapter 3.

## **1.17 Appendix**

Attachments allow authors to load materials that can illuminate the text by not disturbing the reader's focus. These materials include tables, charts, software programs and more. All attachments should be listed on the Appendix. Refer to the **Appendix L**.

# **CHAPTER 2.        GUIDE TO PREPARING A REPORT**

## **2.1 Paper and Size**

Use A4 size paper (210 mm x 297 mm) and white colour paper for preparing the report.

## **2.2 Margins**

In general the margin is the same for every page, which are 4 cm on the left and 2.5 cm on top, right and bottom. Note: The frame in each attachment example is to illustrate the margin position and ignore the frame when writing your actual report.

## 2.3 Page Numbering

Number the pages in sequence as specified in Table 1.1. The page numbers should be written on the right-hand corner, 1.25 cm from the top edge and 2.5 cm from the right edge of the last digit of the number. Numbering pages must meet the following requirements:

- i). The starting part of the report, beginning with the title page, should be numbered with Roman numerals (i, ii, iii etc.); text portion and then use numerical values (1, 2, 3 etc.).
- ii). The first report page is the title page, considered as a page i but not typed.
- iii). The first page of the text part is considered to be page 1 but the number is not typed. Similarly, for each page of the beginning of Section or Chapter, not written next page numbers.
- iv). If the report consists of several parts, the part separator page can be inserted but not numbered and not counted in page headers.

## 2.4 Numbering and Sub-Headings in Chapter

The chapters and sub-headings in the chapter need to be numbered. Numbers are numbered using Roman numerals, CHAPTER I, CHAPTER II, CHAPTER III, and so forth and subtitles in chapters using numerical values. Sub-heading numbering structure in chapters is not denoted but is arranged in order of sub-title level and does not exceed four (4) stages as follows:

Chapter II	First Step (Chapter Title)
2.1	Second Step (sub-heading)
2.1.1	Third Step (sub-sub-heading)
2.1.1.1	Forth Step (sub-sub-sub-heading)

If the chapter title or sub-heading at any of the above stages exceeds a row, then the likelihood is the same as skipping the text. The next sub-heading can be numbered with alphabets. Example of a page in Chapter is shown in **Appendix Q** and **Appendix R**. If the report has multiple parts, use capitalized words **PART ONE, PART TWO, PART THREE** and so on to separate each of these parts.

## 2.5 Typing

Report typing should use a computer and be typed with regular letters (not allowed in flowing letters). The author is advised to use a fixed and standardized font only for the entire report (except for the use of foreign language typed using italics). The font size (height) used in the text is not less than 0.2 cm for upper case and 0.15 cm for lowercase letters. If you are using Microsoft Word



software, please use Times New Roman, 12 or larger. The spacing between the rows in the text is one and a half feet (1.5 spacing). The text in the report should be typed on the side of the page only.

The chapter title should be typed in uppercase and placed in the middle of the left margin with the right. Each chapter should be started on a new page. The chapters and sections of the chapter should be titled. The title can be typed with bold and not necessarily outlined. The first letter of each word in the sub-heading must be capitalized. See examples in **Appendix Q** and **Appendix R**.

## 2.6 Spacing and Format

The author is advised to fulfil the following guidelines in determining the spacing in the text:

- i). The spacing between the upper margin and the chapter number is 2.5 cm;
- ii). The spacing between the chapters with the chapter title, and between the chapter title and the first line of the text is four (4) lines;
- iii). The spacing between the sub-heading and the last line of the previous text is four (4) lines;
- iv). The spacing between the sub-heading and the first line of the next text is two (2) lines;
- v). The spacing between the paragraphs is two (2) lines;
- vi). Start the sub-heading with the number from the left margin;
- vii). Start the first line of the paragraph with a indent (1.2) indent (or 0.5 inch) from the left margin;
- viii). Do not start the first line of the new paragraph below the side of the page;
- ix). The spacing between the words in the queue should be the same, so the 'justified' format is allowed.
- x). The spacing between the last verse and Table, Figure or Illustration is two (2) lines.
- xi). The spacing between the periods (.) And the first letter of the next paragraph (in the same paragraph) is one (1) letter.
- xii). The spacing after comma (,) is one (1) letter. Please see **Appendix Q** and **R** for more details.

## 2.7 Computer Print Manuscripts

The author should type the report by using the computer because any correction of the report can change quickly and easily. Report prints should be made using laser printing machines or equivalent print quality.

## **2.8 Interpretation and Drawing**

Interpretation and drawing shall be clear and may be copied satisfactorily without loss of any information.

## **2.9 Maximum Number of Pages**

The maximum number of pages of the project report is **not more than 120 pages**. The maximum limit is excluding attachments, tables, diagrams and other illustrations. If exceeding these limits, written approval from the Head of Department through their respective Supervisors is needed.

## **2.10 Submission of Report**

The completed report according to the prescribed format must be uploaded into the FTMK's e-Repository system.

## **CHAPTER 3.        GUIDE TO WRITING REFERENCES (HARVARD STYLE)**

### **3.1    Introduction**

The references cited in the text either the source of the reference have been published or not, should be recorded. The citations in the text must be associated with a reference list according to the author and year Harvard Style system.

### **3.2    Method of Writing References in the Text**

When using this system, references in the text must be written in the name of the author only (without the short forms of the original name) as follows:

- (a). Place the publication year in brackets after the name of the author referenced.

Example:

“According to Paredis (1993), a major part of scheduling in economics and engineering is the class of constraint optimization problems”

- (b). If the author's name does not have to be written in a sentence, then write the name and year in parentheses. Example:

“Therefore, research on effective solutions for constraint optimization problems has become a popular research area today (Paredis, 1993).”

- (c). If referenced source material is produced by two authors, write the names of both authors. Example:

“Maintenance scheduling has long been studied, for example in the production of power by Kralj and Petrovic (1995)....”.

(d). For three authors or more, write et al. Example:

“Safaai Deris et al. (1997), using the approach on the University's timetable.”

“Use lowercase letters (a, b, c) to identify two or more identical publication and authors issued in the same year. Example:

“Examples of software that use language constraints are ILOG Solver by Puget and Albert (1994a).”

“The use of objects is very widespread, especially in artificial intelligence programming (Puget and Albert, 1994b).”

(e). Cross references are not allowed in report writing. The author should refer to the source of the original reference material.

### **3.3 Referencing Style Guide Using Author and Year System (Harvard Style)**

All materials referenced in the report should be listed in the Referenced List located at the end of the text. Sequence in the reference list should be arranged alphabetically. For the same author who has two or more publications, please state chronologically, for example, the 1964 publication by Scholfield prior to its publication in 1967.

### **3.4 Writing the Names of the Authors**

The author's name is written in a family name system followed by another name abbreviation such as the following example:

i). Western nation

Example:

Name : John Neville Palvovic

Written as : Palvovic, J.N.

ii). Malay race name

Example:

Name : Mohd Noor B. Abdullah

Written as : Abdullah, M.N.

iii). Arab or Arabian race name

Example (Use family name):

Name : Syed Muhammad Naquib Al-Attas

Written as : Al-Attas, S.M.N.

Example (without family name):

Name : Malik

Written as : Malik

iv). Chinese race name

Example:

Name : Tan Beng Keat

Written as : Tan, B.K.

v). Indian race name

Example 1:

Name : Srinivasan Venkataranam

Written as : Venkataranam, S.

Example 2:

Name : S.N. Gupta

Written as : Gupta, S. N.

### 3.5 Reference List Content

The report reference should contain the following information:

- (a). The author or editor name followed by the year in brackets ( ) without being separated by any punctuation;
- (b). The year is published in brackets ( ) followed by a stop sign (.);
- (c). Published titles (journals and so forth) are printed in italic lines, followed by a stop sign (.);
- (d). Number of volumes, if applicable, written in bold or with the abbreviation "Jil.", Followed by a stop sign (.);
- (e). Number of editions / prints, if applicable, followed by a stop sign (.);
- (f). Place of publication is followed by a colon (:);

- (g). The publisher's name is followed by a period (.);
- (h). The translator's name, if the translation material, is followed by a stop sign (.);
- (i). Periodical publishing titles are written with italics, if regular publication, followed by a period (.)
- (j). Abbreviations "in" and "hlm" or "m.s." (If applicable);
- (k). Number of series, if applicable, followed by a stop sign (.);
- (l). The form of publication, if applicable, is followed by a stop sign (.);
- (m). Writing a reference should be terminated by a stop sign (.).

### 3.6 Referencing Writing Format

References should be written in the reference list according to the following format with hanging indent of 0.25 inches:

Author's name (Year). Title. Journal. Bil. hlm.

#### 3.6.1 Examples of Referencing Formats

##### 3.6.1.1 Individual and Group Authors

*An example for one author:*

Paredis, J. (1993). Genetic State-Space Search for Constraint Optimization Problems. Proc. Of the 13th Int. Joint Conf. on Artificial Intelligence (IJCAI93). San Mateo, USA: Morgan Kaufman.

*An example for two or more authors:*

Puget, J.F and Albert, P. (1994a). SOLVER: Constraints? Objects Descriptions. Technical Report. ILOG S. A.

Puget, J. F. and Albert, P. (1994b). AC++ Implementation of CLP. Technical Report. ILOG S.A.

Pergantis, S. A., Cullen, W.R., Chow, D.T. and Elgendor, G. K. (1997). Liquid Chromatography and Mass Spectrometry for the Speciation of Arsenic Animal Feed Additives. Journal of Chromatography A. 764. 211 - 222.

**OR**

*written as follows:*

Pergantis, S.A., Cullen, W.R., Chow, D.T. and Elgendor, G. K. (1997). Liquid Chromatography and Mass Spectrometry for the Speciation of Arsenic Animal Feed Additives. Journal of Chromatography A. Bil. 764. m.s. 211-222.

### 3.6.1.2 Editor / Organizer

*Example:*

Martin, A.M. (Ed.) (1991). Peat as an Agent in Biological Degradation of Waste. London: Elsevier. 314 - 362.

Lees, R. H. and Thomos T.R., (Eds.) (1974). Chemical Nomenclature Usage. Chishester: Ellis Horwood.

### 3.6.1.3 Author / Corporate Editor

*Example:*

Engineers Joint Council (1969). Thesaurus of Engineering and Scientific terms. New York: Engineers Joint Council.

American Chemical Society (Ed.) (1978). Handbook for Authors of American Chemical Society Publications. Washington, D.C.: American Chemical Society.

## 3.6.2 Type of Reference Materials

In report writing, the author will refer to various types of materials. The following example is a guide for writing references according to their type into the reference list.

#### i). Book

Author's name (Year). Book Title. Edition. Place of publication: Publisher. m.s.

*Example:*

Theusen, G. J. and Fabrycky, W. J. (1984). Engineering Economy. 6th. Ed. Englewood Cliffs, N. J.: Prentice Hall. 150-178.

#### ii). Articles in the book

Article's author name (Year). Title of the Article. dlm. Author's Name of the book. "Title of the book." Place of publication: Publisher. hlm.

*Example:*

Sarmani, S. (1987). Pencemaran Radioaktif. Dlm. Mohamad, A.B. Perspektif Persekitaran. Petaling Jaya: Fajar Bakti. 71-87.

iii). Article in the journal

Author's Name (Year). Title of the Article. Title of the journal. Volume (number). Hlm.

Example:

Mikac, N. and Branica, M. (1994). Complexation of Trialkyllead with Diethyldithiocarbonate. Electroanalysis. 6. 37-43.

iv). Thesis

Author's Name (Year). Title. Thesis, Name of the Institution.

Example::

Desa, M.I (1995). Bus fleet maintenance modeling in a developing country. Ph.D Thesis, University of Salford.

v). Legislation

Name of the county (Year). Legal title.: Number of the Legislation

Example:

Malaysia (1983). Perintah Monumen Lama dan Tapak Tanah Bersejarah.: P.U. (A)41 983.

vi). Standard

Name of the institution (Year). Title of the standard. Publication placet: (Number standard)

Example:

British Standards Institution (1987). Tongued And Grooved Software Flooring. London: (BS 1297).

vii). Patents



Owner's name (Year). Title of the patents.(Number patents).

Example:

Lindgren, E. A. (1960). Screen Room Air Inlet and Wave Guard.(U.S. Patent 2,925, 457).

viii). Trading catalogue

Name of manufacturer (Year). Title. Publication place: Note.

Example:

Howick partitioning Ltd. (1984). Howick: Partitioning in Business. Redhil (U.K.): Trade brochure.

Please refer to **Appendix S** for reference list examples according to the author and year system.

### 3.6.3 References from Internet

While the Internet provides a wide-ranging reference source, it is sometimes difficult to quote a website as a reference because the information required is from a different site area. Additionally, information on the Internet is usually not permanent and is constantly undergoing renewal from time to time. Therefore, some information, such as author or date of publication, can be difficult to identify. When referring a web page that changes from time to time, it is important to note that the website's access date as well as the address of the website.

#### 3.6.3.1 Website

*Usage in the text*

The author should quote the author's name / authoring body along with the date created or the last date it is revised.

Example:

(International Narcotics Control Board 1999)

*In the Reference List*

The author should include the following:

- (i). Author (whether the individual or organization is responsible for the site)
- (ii). Year (date of website created or updated date)
- (iii).Website sponsor's name (if any)
- (iv).Access date (day month year)

(v). The complete URL or Internet address is placed in sharp brackets (<>)

Example:

International Narcotics Control Board 1999, United Nations, accessed 1 October 1999,  
<<http://www.incb.org>>

### 3.6.3.2 Quotes from pages or documents in a web page

*Usage in the text*

The author should quote the author's name / authoring body along with the date created or the last date it is revised.

Example:

(Winston 1999) or (World Health Organisation 2013)

*In the Reference List*

The author should include the following:

- i). The author (whether the individual or organization responsible for the website)
- ii). Year (date of website created or updated date)
- iii). Title - in italics
- iv). Website sponsor's name (if any)
- v). Access date (day month year)
- vi). The complete URL or Internet address is placed in sharp brackets (<>)

Example:

Winston, J 1999, A look at referencing, AAA Educational Services, accessed 20 October 2002,  
<<http://www.aaa.edu.au/aaa.html>>. United Nations Web Services 2006,  
World Health Organisation 2013, Financial crisis and global health, The United Nations, accessed  
1 August 2013, <[http://www.who.int/topics/financial\\_crisis/en/](http://www.who.int/topics/financial_crisis/en/)> \_

### 3.6.3.3 Website with Author's Name

*Quotes in text*

If the author's name for a site is unknown, the site's quote should contain the title of the website with the date created.

Example:

(Improve indigenous housing 2007)

*In the References List*

Example:

Improve indigenous housing now, government told, 2007. accessed 8 February 2009,  
<<http://www.architecture.com.au/i-cms?page=10220>>

#### **3.6.3.4 Website without Date**

*Quotes in text*

If the date for a site is unknown, use the abbreviation n.d. (no date).

Example:

(ArtsNSW n.d.)

*In the References List*

Example:

ArtsNSW n.d., New South Wales Premier's Literary Awards, NSW Department of the Arts, Sport and Recreation, accessed 19 June 2007,  
<<http://www.arts.nsw.gov.au/awards/LiteraryAwards/litawards.htm>>

#### **3.6.3.5 Online Journal**

*Usage in the Text*

The author shall include the author's name along with the date the document is created.

Example:

(Morris 2004)

*In the References List*

The author should include the following information:

Name of the author and abbreviation

- i). The title of the Article (placed between single quotation marks)
- ii). The title of the Journal in italic
- iii). Publishing's information
- iv). Access date (day of the year)
- v). The complete URL or Internet address is placed in sharp brackets (<>)

Example:

Morris, A 2004, 'Is this racism? Representations of South Africa in the Sydney Morning Herald since the inauguration of Thabo Mbeki as president'. Australian Humanities Review, Issue 33, August - October 2004, accessed 11 May 2007, <<http://www.australianhumanitiesreview.org/archive/Issue-August-2004/morris.html>>.

### 3.6.3.6 Electronic Book (E-Book)

*Usage in the Text*

Quotes should be made like a printed book.

Example:

(Lloyd 2005)

*In the References List*

The author should include the following information:

- i). Name of author or editor.
- ii). Date of publication
- iii). Title in italics
- iv). Electronic book format
- v). Access date (day month year)
- vi). The complete URL or Internet address is placed in sharp brackets (<>)

Example:

Lloyd, CB (ed.) 2005, Growing up global: The changing transitions for adulthood in developing countries, e-book, accessed 5 May 2007, <<http://www.nap.edu/books/11174/html/index.html>>

### 3.6.3.7 Newspaper

*Newspaper sections from electronic databases with author's name*

- Usage in the Text

Example:

(Pianin 2001)

*In the References List*

The author should include the following information:

- i). Author's name.
- ii). Year article published

- iii). The title of the newspaper is in italic
- iv). The date the article was published (day, month, year, page - if any)
- v). Access date (day month year)
- vi). The complete URL or Internet address is placed in sharp brackets (<>)
- vii). the name of the database
- viii). item number (if any)

Example:

Pianin, E 2001, As coal's fortunes climb, mountains tremble in W.Va; energy policy is transforming lives, The Washington Post, 25 February 2001, p. A03, accessed March 2001 from Electric Library Australasia

*Newspaper sections from electronic databases without author's name*

- Usage in the Text

Example 1:

(New York Daily Times 1830)

Example 2:

An account of the popularity of the baby tapir in The Independent (2013) stated that . . .

In the References List

If there is no author's name, the title of the newspaper will be listed first.

Example:

Amending the Constitution, New York Daily Times, 16 October 1851, p. 2, accessed 15 July 2007 from ProQuest Historical Newspapers database.

Baby tapir wins hearts at zoo, The Independent, 9 August 2013, Accessed 25 January 2014, <<http://www.independent.ie/world-news/and-finally/baby-tapir-wins-hearts-at-zoo-30495570.html>>

*Online newspaper section*

- Usage in the Text

Example:

(Coorey 2007)

In the References List

If there is no author's name, the title of the newspaper will be listed first.

Example:

Coorey, P 2007, Costello hints at green safety net, Sydney Morning Herald, 10 May, accessed 14 May 2012, <<http://www.smh.com.au/news/business/costello-hints-at-green-safety-net/2007/05/09/1178390393875.html>>

## **CHAPTER 4.        GUIDE TO WRITING NOTES AND FOOTNOTES**

### **4.1    General Guide**

Note is additional information inserted in a compilation. Footnotes are allowed and placed at the bottom of a page. It is used to describe or provide additional information on what is contained in the textual content of the page. Footnotes are recorded according to numerical values and in order of 1, 2, 3 and so on.

### **4.2    Uniformity of Writing**

The writing of a footnote is different from the reference writing in terms of the author's name and the use of the type of punctuation. In the footnote, the author's name is written according to the pronunciation and the natural order of the name. Comma punctuation marks or brackets are used to separate the author's name, article's title and publication's information. In reference writing, a full stop is used for this purpose. The font size of the footnote is 10 pt. The difference between footnote and reference can be seen from the following format:

[ *BAHASA MELAYU* VERSION ]



## **CHAPTER 1. PANDUAN UMUM UNTUK MENULIS LAPORAN**

### **1.1 Pengenalan**

Buku panduan ini adalah sebagai bahan rujukan untuk pelajar Fakulti Teknologi Maklumat dan Komunikasi, Universiti Teknikal Malaysia Melaka. Semakan semula akan dilakukan memandangkan perubahan dan keperluan semasa terutamanya perihal kaedah menyediakan satu persembahan penulisan ilmiah yang baik dengan mengambilkira keperluan peraturan pengajian di UTeM dan perkembangan pesat teknologi maklumat dan komputer. Semakan akan dibuat berdasarkan cadangan dan saranan oleh J/K Akademik Fakulti dan Jawatankuasa Projek Sarjana Muda dan Projek Diploma (JK Projek) Fakulti. Beberapa dokumen penting yang berkaitan telah dirujuk oleh JK Projek semasa penyediaan awal dokumen panduan ini.

Garis panduan yang dimuatkan dalam buku ini adalah untuk kegunaan pelajar FTMK, UTeM yang perlu menyediakan laporan atau penulisan ilmiah/projek kajian sebagai memenuhi keperluan kurikulum Ijazah Sarjana Muda atau Projek Sarjana Muda (PSM). Perbincangan dalam panduan ini keseluruhannya juga menggunakan perkataan "laporan" bagi maksud penulisan ilmiah untuk Projek Sarjana Muda.

### **1.2 Maksud Sebutan Laporan**

Maksud sebutan "laporan" dalam buku panduan ini diterangkan dalam PENGENALAN pada Seksyen 1.1.

### **1.3 Susunan Laporan**

Laporan mengandungi beberapa bahagian yang disusun mengikut urutan dalam Jadual 1.1.

Jadual 1.1: Sususan dan urutan kandungan laporan

Seksyen	Perkara	Status	Appendix	Perkara
–	Kulit Depan Laporan	Wajib	A	<ul style="list-style-type: none"> <li>✓ Tidak mempunyai nombor muka surat</li> <li>✓ Jidar (margin) kiri: 4.0 cm</li> <li>✓ Jidar kanan: 2.5 cm</li> <li>✓ Jidar atas/bawah: 2.5 cm</li> <li>✓ Saiz huruf: 12 pt.</li> <li>✓ Jenis fon (<i>font</i>): Times New Roman</li> </ul>
1.4	Borang Pengesahan Status Laporan	Wajib	B	Tidak bernombor
1.5	Halaman Judul	Wajib	C	<ul style="list-style-type: none"> <li>✓ Nombor muka surat - nombor Roman kecil (i)</li> <li>✓ Jidar kiri: 4.0 cm</li> <li>✓ Jidar kanan: 2.5 cm</li> <li>✓ Jidar atas/bawah: 2.5 cm</li> <li>✓ Saiz huruf: 12 pt.</li> <li>✓ Jenis fon: Times New Roman</li> </ul>
1.6	Halaman Pengakuan	Wajib	D	<ul style="list-style-type: none"> <li>✓ Nombor muka surat - nombor Roman kecil</li> <li>✓ Saiz huruf: 12 pt.</li> <li>✓ Mempunyai ukuran jidar yang sama dengan Halaman Judul</li> <li>✓ Jenis fon: Times New Roman</li> </ul>
1.7	Halaman Dedikasi	Pilihan	E	<ul style="list-style-type: none"> <li>✓ Nombor muka surat - nombor Roman kecil</li> <li>✓ Saiz huruf: 12 pt.</li> <li>✓ Jenis fon: Times New Roman</li> </ul>
1.8	Halaman Penghargaan	Pilihan	F	<ul style="list-style-type: none"> <li>✓ Nombor muka surat - nombor Roman kecil</li> <li>✓ Saiz huruf: 12 pt.</li> <li>✓ Jenis fon: Times New Roman</li> </ul>

1.9	Halaman <i>Abstract &amp;</i> Abstrak	Wajib	G	<ul style="list-style-type: none"> <li>✓ Nombor muka surat - nombor Roman kecil</li> <li>✓ Mempunyai dua versi – <i>English</i> dan Bahasa Melayu</li> <li>✓ Mempunyai ukuran jidar yang sama dengan Halaman Judul</li> <li>✓ Saiz huruf: 12 pt.</li> <li>✓ Jenis fon: Times New Roman</li> </ul>
1.10	Halaman Kandungan	Wajib	H	<ul style="list-style-type: none"> <li>✓ Nombor muka surat - nombor Roman kecil</li> <li>✓ Mempunyai ukuran jidar yang sama dengan Halaman Judul</li> <li>✓ Saiz huruf: 12 pt.</li> <li>✓ Jenis fon: Times New Roman</li> </ul>
1.11	Halaman Senarai Jadual	Wajib	I	<ul style="list-style-type: none"> <li>✓ Nombor muka surat - nombor Roman kecil</li> <li>✓ Mempunyai ukuran jidar yang sama dengan Halaman Judul</li> <li>✓ Saiz huruf: 12 pt.</li> <li>✓ Jenis fon: Times New Roman</li> </ul>
1.12	Halaman Senarai Rajah	Wajib	J	<ul style="list-style-type: none"> <li>✓ Nombor muka surat - nombor Roman kecil</li> <li>✓ Mempunyai ukuran jidar yang sama dengan Halaman Judul</li> <li>✓ Saiz huruf: 12 pt.</li> <li>✓ Jenis fon: Times New Roman</li> </ul>
1.13	Halaman Senarai Simbol/ Singkatan/ Tatanama/ Istilah	Wajib	K	<ul style="list-style-type: none"> <li>✓ Nombor muka surat - nombor Roman kecil</li> <li>✓ Mempunyai ukuran jidar yang sama dengan Halaman Judul</li> <li>✓ Saiz huruf: 12 pt.</li> <li>✓ Jenis fon: Times New Roman</li> </ul>
1.14	Halaman Senarai Lampiran	Wajib (Jika ada lampiran)	L	<ul style="list-style-type: none"> <li>✓ Nombor muka surat - nombor Roman kecil (jika ada)</li> <li>✓ Mempunyai ukuran jidar yang sama dengan Halaman Judul</li> <li>✓ Saiz huruf: 12 pt.</li> <li>✓ Jenis fon: Times New Roman</li> </ul>

1.15	Teks / Kandungan Laporan	Wajib	M	<ul style="list-style-type: none"> <li>✓ Nombor muka surat - nombor Arab dan dimulai dengan nombor 1</li> <li>✓ Saiz huruf: 12 pt.</li> <li>✓ Jenis fon: Times New Roman</li> <li>✓ Kandungan adalah berdasarkan program – rujuk Panduan Penulisan PSM</li> </ul>
1.16	Halaman Rujukan	Wajib	S	<ul style="list-style-type: none"> <li>✓ Nombor muka surat - nombor Arab bersambungan dari teks</li> <li>✓ Saiz huruf: 12 pt.</li> <li>✓ Jenis fon: Times New Roman</li> <li>✓ Rujuk Panduan Menulis Rujukan untuk format rujukan</li> </ul>
1.17	Halaman Lampiran	Pilihan	-	<ul style="list-style-type: none"> <li>✓ Nombor muka surat - nombor Arab bersambungan dari teks</li> </ul>

#### 1.4 Pengesahan Penyelia

Laporan yang hendak diserahkan untuk tujuan peperiksaan hendaklah mendapat pengesahan penyelia terlebih dahulu. Contoh Pengesahan Penyelia boleh didapati di **Appendix B**.

#### 1.5 Halaman Judul

Halaman judul mestilah mempunyai maklumat yang disusun mengikut urutan berikut:

- ✓ Judul lengkap laporan;
- ✓ Nama penuh penulis seperti dalam kad pengenalan atau passport (antarabangsa);
- ✓ Pernyataan tujuan laporan;
- ✓ Nama Fakulti / Institut / Pusat tempat penulis berdaftar;
- ✓ Nama Universiti; dan
- ✓ Tahun diserahkan (jika keputusan peperiksaan mengkehendaki supaya laporan dirombak dan diserahkan semula untuk peperiksaan kali kedua, maka tahun penyerahan yang baru hendaklah digunakan)

Maklumat di atas hendaklah ditulis dengan menggunakan huruf gaya *Times New Roman* dengan saiz 12 pt. Selain itu, Halaman Judul mestilah mempunyai Pernyataan tujuan laporan. Ia merupakan pernyataan tentang tujuan sesuatu laporan itu disediakan. Rujuk **Appendix C** untuk contoh Halaman Judul beserta dengan pernyataan tujuan laporan.

### 1.6 Halaman Pengakuan

Halaman pengakuan mengandungi pengakuan tentang keaslian laporan. Ia hendaklah ditandatangani oleh penulis dan penyelia projek. Contoh halaman pengakuan boleh di rujuk pada **Appendix D**.

### 1.7 Halaman Dedikasi (Pilihan)

Penyataan dedikasi hendaklah ringkas, iaitu tidak lebih daripada satu perenggan dan tidak mengandungi sebarang nombor, carta atau gambar. Rujuk **Appendix E** untuk contoh Halaman Dedikasi.

### 1.8 Halaman Penghargaan (Pilihan)

Halaman ini hendaklah ditulis dalam satu muka surat sahaja. Penghargaan dirakamkan kepada orang perseorangan atau organisasi yang telah memberikan sebarang bantuan dalam penyediaan laporan. Rujuk **Appendix E** untuk contoh Halaman Penghargaan.

### 1.9 Halaman *Abstract* & Abstrak

Abstrak hendaklah ditulis dalam dua bahasa iaitu *English* dan diikuti oleh terjemahannya dalam Bahasa Melayu di muka surat berikutnya. Abstrak mestilah ringkas, ditulis dalam satu langkau (*spacing*) dan format perwajaran (*justification*) serta tidak melebihi 300 perkataan dalam satu muka surat sahaja. Abstrak tidak sama dengan sinopsis atau ringkasan laporan. Abstrak ditulis dengan satu perenggan. Ia hendaklah menyatakan dengan ringkas bidang kajian laporan, masalah yang hendak diselesaikan, cara penyelesaian, proses penyelidikan; dan keputusan yang diperolehi. Bagi penulisan yang dibuat dalam *English*, abstrak hendaklah dalam bahasa tersebut dan diikuti dengan terjemahannya dalam Bahasa Melayu. Rujuk **Appendix G** untuk contoh Abstrak.

### 1.10 Halaman Kandungan

Halaman kandungan hendaklah dimulakan pada halaman baru dan mengandungi senarai bahan yang terdapat dalam laporan, iaitu Bahagian, Bab dan pecahan-pecahan utama daripada bab-bab berkenaan. Kandungan laporan adalah berdasarkan kursus. Rujuk “*PART II: BACHELOR*

*PROJECT CONTENTS GUIDE*” untuk mengetahui kandungan laporan akhir dan **Appendix H** untuk menulis format halaman kandungan laporan.

### **1.11 Halaman Senarai Jadual**

Senarai ini mengandungi semua tajuk jadual yang dimuatkan dalam laporan. Nombor muka surat tempat jadual diletakkan hendaklah dicatatkan dalam senarai ini. Urutan nombor jadual hendaklah dibuat mengikut bab. Rujuk **Appendix I** untuk contoh Halaman Senarai Jadual.

### **1.12 Halaman Senarai Rajah**

Rajah merangkumi gambarajah, fotograf, lukisan, graf, carta dan peta. Seperti senarai jadual, nombor muka surat dan tempat rajah diletakkan hendaklah dibuat mengikut bab. Rujuk **Appendix J** untuk contoh Halaman Senarai Rajah.

### **1.13 Halaman Senarai Simbol/ Singkatan/ Tatanama/ Istilah**

Halaman ini menyenaraikan simbol atau singkatan atau tatanama atau istilah yang terdapat dalam teks. Urutan susunan adalah seperti berikut:

- Huruf Roman - ikut abjad
- Huruf Greek - ikut abjad
- Superskrip - ikut abjad
- Subskrip - ikut abjad

Rujuk **Appendix K** untuk contoh senarai simbol.

### **1.14 Halaman Senarai Lampiran**

Laporan tidak semestinya mengandungi lampiran. Sekiranya perlu, data kajian, jadual, contoh soal-selidik, peta, gambar dan sebagainya yang terlalu panjang untuk dimasukkan ke dalam teks atau yang tidak diperlukan secara langsung bagi menjelaskan perkara yang dibincangkan dalam teks dan boleh dimasukkan ke dalam lampiran. Lampiran boleh diberi nama seperti Appendix A, Appendix B dan seterusnya bergantung kepada jenis dan banyaknya bahan yang disertakan sebagai lampiran. Lampiran juga boleh diberi tajuk-tajuk tertentu. Rujuk **Appendix L** untuk contoh senarai lampiran.

### **1.15 Teks / Kandungan Laporan**

Teks dalam laporan hendaklah mengandungi bab-bab yang diberi judul dan setiap judul hendaklah membayangkan kandungannya. Setiap bab hendaklah dimulakan pada halaman baru.

Bab boleh dipecahkan kepada bahagian yang diberi judul kecil. Judul dan judul kecil bab mestilah dinomborkan. Rujuk **Appendix Q** untuk contoh teks utama.

Teks ditulis perenggan demi perenggan. Elakkan menulis perenggan yang panjang. Setiap perenggan sebaiknya menerangkan satu isu atau perkara dan hendaklah ada kesinambungan antara satu perenggan dengan perenggan yang lain. Teks antara lain, hendaklah mengandungi:

- i) Pengenalan dan latar belakang kajian atau penyelidikan;
- ii) Penerangan terperinci tentang kajian atau penyelidikan yang dijalankan termasuk teori, model, bahan dan kaedah yang digunakan;
- iii) Analisa, reka bentuk dan pembangunan prototaip penyelesaian serta kaedah dan dapatan ujian penyelesaian; dan
- iv) Rumusan atau kesimpulan dan implikasi penemuan (dapatan).

#### **1.15.1 Rujukan Dalam Teks**

Apabila maklumat atau idea atau nukilan diambil daripada sesuatu sumber, penulis hendaklah menyatakannya dalam teks. Rujukan dalam teks ini hendaklah ditulis mengikut salah satu daripada kaedah yang ditetapkan dalam Bab 3.

#### **1.15.2 Petikan Dalam Teks**

Petikan dalam teks hendaklah ditulis dalam perenggan yang berasingan. Petikan yang ditulis dalam bahasa lain hendaklah menggunakan huruf condong. Contoh cara menulis petikan diberi dalam **Appendix M**.

#### **1.15.3 Jadual Dalam Teks**

Jadual yang dimuatkan ke dalam teks hendaklah dinomborkan dengan angka Arab. Setiap jadual diberi tajuk yang diletak di atas jadual tersebut pada jarak satu baris serta huruf ditebalkan. Nombor jadual hendaklah dikaitkan dengan bab (Contohnya Jadual 4.3 bagi jadual yang ke-3 dalam Bab 4). Sila lihat contoh di **Appendix N**. Jadual sebaik-baiknya diletak selepas sahaja dirujuk buat kali pertama dalam teks. Jika tidak, jadual hendaklah dikumpulkan pada satu tempat yang sesuai. Semua jadual hendaklah disenaraikan dalam halaman. Senarai Jadual seperti dalam **Appendix I**.

#### **1.15.4 Rajah Dalam Teks**

Bahan ilustrasi contohnya peta, carta, lukisan, graf, gambarajah dan fotograf disebut "Rajah". Setiap rajah hendaklah jelas dan bermutu tinggi dan diberi nombor angka Arab. Tajuk rajah

diletak di bawah bahan ilustrasi tersebut pada jarak satu baris serta huruf ditebalkan. Nombor rajah hendaklah dikaitkan dengan bab (Contohnya Rajah 4.3 bagi rajah ke-3 dalam Bab 4). Sila lihat contoh di **Appendix O**.

Rajah sebaik-baiknya diletak selepas sahaja dirujuk buat kali pertama dalam teks. Jika tidak, rajah hendaklah dikumpulkan pada satu tempat yang sesuai. Semua rajah hendaklah disenaraikan dalam halaman Senarai Rajah seperti dalam **Appendix J**.

Bahan ilustrasi dalam bentuk disket, slaid atau seumpamanya hendaklah dimuatkan dalam poket yang dibuat khas dan diletak di bahagian dalam kulit belakang. Bahan ilustrasi dalam bentuk pelan, peta, carta, graf dan sebagainya yang berukuran besar, hendaklah dikecilkan supaya dapat dimuatkan ke dalam satu halaman. Bahan ilustrasi tertentu hendaklah memenuhi syarat berikut:

- **Fotograf** – Fotograf yang digunakan sebagai bahan ilustrasi hendaklah dilekatkan dalam teks dengan menggunakan gam yang bermutu tinggi atau kaedah yang lebih baik.
- **Keratan akhbar dan sebagainya** – Lampirkan salinan yang jelas dan bermutu tinggi sahaja.
- **Peta dan Fotograf Udara** – Peta dan fotograf udara yang hendak dimuatkan ke dalam laporan perlu mendapat kebenaran bertulis Ketua Pengarah Pemetaan Negara. Permohonan hendaklah dibuat menggunakan borang PPN 14 yang boleh didapati dari- pada Perpustakaan. Lihat contoh di **Appendix P**.

Dengan adanya teknologi komputer terkini, bahan ilustrasi seberapa boleh hendaklah dirakamkan menggunakan pengimbas (*scanner*) dan dicetak menggunakan pencetak berwarna bermutu tinggi.

## 1.16 Rujukan

Rujukan merupakan bahan yang dirujuk semasa menyediakan laporan. Penulis diingatkan supaya menyenaraikan bahan yang dirujuk dalam halaman rujukan selepas teks. Senarai ini disusun mengikut satu daripada kaedah yang diberi dalam Bab 3.

## 1.17 Lampiran

Lampiran membolehkan penulis memuatkan bahan yang dapat memberi penerangan tambahan kepada teks dengan tidak mengganggu tumpuan pembaca. Bahan-bahan ini termasuk jadual, carta, aturcara perisian dan lain-lain. Semua lampiran hendaklah disenaraikan dalam halaman Senarai Lampiran seperti dalam **Appendix L**.



## CHAPTER 2. PANDUAN UNTUK MENYEDIAKAN LAPORAN

### 2.1 Kertas dan Saiz

Gunakan kertas bersaiz A4 (210 mm x 297 mm) dan berwarna putih untuk penulisan laporan.

### 2.2 Jidar (*margins*)

Pada amnya jidar adalah sama bagi tiap-tiap muka surat, iaitu 4 cm di sebelah kiri dan 2.5 cm di sebelah atas, kanan dan bawah. Note : Rangka pada setiap contoh lampiran adalah untuk menggambarkan kedudukan jidar dan sila abaikan rangka tersebut apabila menulis laporan sebenar anda.

### 2.3 Penomboran Muka Surat

Nomborkan muka surat mengikut urutan seperti yang ditetapkan dalam Jadual 1.1. Nombor muka surat hendaklah ditulis di sudut atas sebelah kanan, 1.25 cm dari tepi atas dan 2.5 cm dari tepi sebelah kanan digit terakhir nombor berkenaan. Penomboran muka surat hendaklah memenuhi syarat berikut:

- i). Bahagian permulaan laporan, bermula dari halaman judul, hendaklah dinombor dengan angka kecil Roman (i, ii, iii dsb); bahagian teks dan selepasnya hendaklah menggunakan angka Arab (1, 2, 3 dsb).
- ii). Halaman pertama laporan ialah halaman judul, dianggap sebagai muka surat i tetapi tidak ditaip.
- iii). Halaman pertama bahagian teks dianggap sebagai halaman 1 tetapi nombornya tidak ditaip. Begitu juga bagi halaman setiap permulaan Bahagian atau Bab, tidak ditulis nombor muka surat berikutnya.
- iv). Jika laporan terdiri daripada beberapa bahagian, halaman pemisah bahagian boleh dimasukkan tetapi tidak dinomborkan dan tidak dikira dalam penomboran muka surat.

## 2.4 Penomboran Bab dan Sub-Judul Dalam Bab

Bab dan sub-judul dalam bab perlu dinomborkan. Bab dinomborkan menggunakan angka besar Roman iaitu CHAPTER I, CHAPTER II, CHAPTER III dan sebagainya dan sub- judul dalam bab menggunakan angka Arab. Struktur penomboran sub-judul dalam bab tidak diensot tetapi disusun mengikut urutan tahap sub-judul dan tidak melebihi empat (4) tahap seperti berikut:

Chapter II	Tahap Pertama (Judul Bab)
2.1	Tahap Kedua (sub-judul)
2.1.1	Tahap Ketiga (sub-sub-judul)
2.1.1.1	Tahap Keempat (sub-sub-sub-judul)

Jika judul Bab atau sub-judul pada mana-mana tahap tersebut di atas melebihi satu baris, maka langkaunya adalah sama dengan langkau dalam teks. Sub-judul seterusnya boleh diberi nombor dengan huruf abjad. Contoh halaman dalam Bab ditunjukkan dalam **Appendix Q** dan **Appendix R**. Sekiranya laporan mempunyai beberapa bahagian, gunakan perkataan dengan huruf besar iaitu **PART ONE, PART TWO, PART THREE** dan seterusnya untuk memisahkan masing-masing bahagian tersebut.

## 2.5 Penaipan

Penaipan laporan hendaklah menggunakan komputer dan ditaip dengan huruf biasa (tidak dibenarkan huruf yang berbunga-bunga). Penulis dinasihatkan supaya menggunakan satu jenis huruf yang tetap dan standard sahaja pada keseluruhan laporan (kecuali yang melibatkan penggunaan bahasa asing ditaip menggunakan huruf condong). Saiz (tinggi) huruf yang digunakan dalam teks tidak kurang daripada 0.2 cm bagi huruf besar dan 0.15 cm bagi huruf kecil. Jika anda menggunakan perisian Microsoft Word, sila gunakan jenis huruf Times New Roman, bersaiz 12 atau lebih besar. Jarak di antara baris dalam teks ialah satu setengah langkau (1.5 spacing). Teks dalam laporan hendaklah ditaip pada sebelah muka surat sahaja.

Judul bab hendaklah ditaip dengan huruf besar dan diletak di tengah-tengah antara jidar kiri dengan kanan. Setiap bab hendaklah dimulakan di atas muka surat yang baru. Bab dan bahagian dalam bab hendaklah diberi judul. Judul boleh ditaip dengan huruf tebal dan tidak perlu digariskan. Huruf pertama setiap perkataan dalam sub-judul hendaklah huruf besar. Lihat contoh dalam **Appendix Q** dan **Appendix R**.

## 2.6 Jarak dan Format

Penulis dinasihatkan supaya memenuhi panduan berikut dalam menentukan jarak dalam teks:

- i) Jarak di antara jidar atas dengan nombor bab ialah 2.5 cm;
- ii) Jarak di antara bab dengan judul bab, dan di antara judul bab dengan baris pertama teks ialah empat(4) baris;
- iii) Jarak di antara sub-judul dengan baris terakhir teks sebelumnya ialah empat (4) baris;
- iv) Jarak di antara sub-judul dengan baris pertama teks selepasnya ialah dua(2) baris;
- v) Jarak di antara perenggan ialah dua(2) baris;
- vi) Mulakan sub-judul beserta nombornya dari jidar kiri;
- vii) Mulakan baris pertama perenggan dengan ensotan (indent) sebesar 1.27 cm (atau 0.5 inci) dari jidar kiri;
- viii) Jangan mulakan baris pertama perenggan baru di bawah sebelah muka surat;
- ix) Jarak di antara perkataan dalam barisan hendaklah sama, oleh itu format 'justified' dibenarkan.
- x) Jarak di antara ayat terakhir dengan Jadual, Rajah atau Ilustrasi ialah dua (2) baris.
- xi) Jarak di antara noktah (.) dengan huruf pertama ayat berikutnya (dalam perenggan yang sama) ialah satu (1) huruf.
- xii) Jarak selepas koma (,) ialah satu (1) huruf. Sila lihat **Appendix Q** dan **R** untuk lebih terperinci.

## 2.7 Naskah Cetakan Komputer

Penulis hendaklah menaip laporan dengan menggunakan komputer kerana cara ini pembetulan dibuat dengan cepat dan mudah. Cetakan laporan hendaklah dibuat menggunakan mesin cetak 'laser' atau kualiti cetakan setaraf.

## 2.8 Penghurufan dan Lukisan

Penghurufan dan lukisan hendaklah jelas dan boleh dibuat salinan dengan memuaskan tanpa kehilangan sebarang maklumat.

## 2.9 Had Maksimum

Had panjang laporan projek adalah **tidak melebihi 120 muka surat**. Had maksimum ialah tidak termasuk lampiran, jadual, gambarajah dan lain-lain ilustrasi. Jika melebihi had ini, hendaklah memohon kelulusan bertulis daripada Ketua Jabatan melalui Penyelia masing-masing.

## **2.10 Penghantaran Laporan**

Laporan yang telah siap mengikut format yang ditetapkan perlu muat naik ke dalam sistem e-Repository FTMK.

## CHAPTER 3. PANDUAN MENULIS RUJUKAN (GAYA *HARVARD*)

### 3.1 Pengenalan

Rujukan yang dinukil dalam teks sama ada sumber rujukan itu telah diterbitkan atau tidak, hendaklah direkodkan. Nukilan dalam teks hendaklah dihubungkan dengan senarai rujukan mengikut sistem pengarang dan tahun sistem *Gaya Harvard*.

### 3.2 Kaedah Menulis Rujukan Dalam Teks

Apabila menggunakan sistem ini, rujukan dalam teks hendaklah ditulis atas nama pengarang sahaja (tanpa nama ringkasannya) seperti berikut:

- (a). Meletakkan tahun penerbitan dalam kurungan selepas nama pengarang yang dirujuk.

Contoh:

“Menurut Paredis (1993), sebilangan besar masalah utama penjadualan dalam bidang ekonomi dan kejuruteraan tergolong ke dalam kelas masalah pengoptimuman kekangan.”

- (b). Jika nama pengarang tidak perlu ditulis dalam ayat, maka tuliskan nama dan tahun dalam kurungan. Contoh:

“Oleh itu, penyelidikan terhadap kaedah penyelesaian yang berkesan bagi masalah pengoptimuman kekangan ini menjadi satu bidang kajian yang popular dewasa ini (Paredis, 1993).”

(c). Sekiranya bahan sumber yang dirujuk dihasilkan oleh dua pengarang, tuliskan nama kedua-dua pengarang. Contoh:

“Penjadualan senggaraan telah lama dikaji, contohnya dalam penghasilan kuasa oleh Kralj dan Petrovic (1995)....”.

(d). Bagi tiga pengarang atau lebih, tuliskan et al. Selepas nama pengarang pertama. Contoh:

“Safaai Deris et al. (1997), menggunakan pendekatan tersebut ke atas jadual waktu Universiti.”

Gunakan huruf kecil (a,b,c) untuk mengenalpasti dua atau lebih penerbitan dan pengarang yang sama dan dikeluarkan pada tahun yang sama. Contoh:

“Contoh perisian yang menggunakan bahasa pengaturcaraan kekangan ialah ILOG Solver oleh Puget dan Albert (1994a).”

“Penggunaan objek amat meluas, terutamanya dalam pengaturcaraan kepintaran buatan (Puget dan Albert, 1994b).”

(e). Rujukan silang (*cross reference*) tidak dibenarkan dalam penulisan laporan. Penulis hendaklah merujuk kepada sumber bahan rujukan yang asal.

### **3.3 Panduan Menulis Senarai Rujukan Mengikut Sistem Pengarang Dan Tahun (Gaya Harvard)**

Semua bahan yang dirujuk dalam laporan hendaklah disenarai dalam Senarai Rujukan yang diletak di bahagian akhir teks. Susunan rujukan dalam senarai rujukan hendaklah disusun mengikut abjad. Bagi pengarang yang sama yang mempunyai dua penerbitan atau lebih, nyatakan secara kronologi, misalnya penerbitan 1964 oleh Scholfield didahulukan sebelum penerbitannya pada 1967.

### **3.4 Panduan Menulis Nama Pengarang Dalam Senarai Rujukan**

Nama pengarang ditulis mengikut sistem nama keluarga diikuti oleh singkatan nama lain seperti contoh berikut:

i). Nama warga Barat

Contoh:

nama : John Neville Palvovic  
ditulis : Palvovic, J.N.

ii). Nama bangsa Melayu

Contoh:

Nama : Mohd Noor B. Abdullah  
Ditulis : Abdullah, M.N.

iii). Nama bangsa Arab atau berunsur Arab

Contoh (guna nama keluarga):

Nama : Syed Muhammad Naquib Al-Attas  
Ditulis : Al-Attas, S.M.N.

Contoh (tiada nama keluarga):

Nama : Malik  
Ditulis : Malik

iv). Nama bangsa Cina

Contoh:

Nama : Tan Beng Keat  
Ditulis : Tan, B.K.

v). Nama bangsa India

Contoh 1:

Nama : Srinivasan Venkataranam  
Ditulis : Venkataranam, S.

Contoh 2:

Nama : S.N. Gupta  
Ditulis : Gupta, S. N.

### 3.5 Kandungan Senarai Rujukan

Rujukan laporan hendaklah mengandungi maklumat seperti berikut:

- (a). Nama penulis atau editor diikuti dengan tahun dalam kurungan ( ) tanpa dipisahkan oleh sebarang tanda baca;
- (b). Tahun terbit dalam kurungan ( ) diikuti dengan tanda noktah (.);
- (c). Judul terbitan (jurnal dan sebagainya) dicetak dalam huruf condong, diikuti dengan tanda noktah (.);
- (d). Bilangan jilid, jika berkaitan, ditulis dengan huruf tebal atau dengan singkatan “Jil.”, diikuti dengan tanda noktah (.);
- (e). Bilangan edisi/cetakan, jika berkenaan, diikuti dengan tanda noktah (.);
- (f). Tempat tertib diikuti dengan tanda noktah bertindih (: );
- (g). Nama penerbit diikuti dengan tanda noktah (.);
- (h). Nama penterjemah, jika bahan terjemahan, diikuti dengan tanda noktah (.);
- (i). Judul penerbitan berkala ditulis dengan huruf condong, jika penerbitan berkala, diikuti dengan tanda noktah (.)
- (j). Kata singkatan “dlm.” dan “hlm.” atau “m.s.”(jika berkaitan);
- (k). Bilangan siri, jika berkaitan, diikuti dengan tanda noktah (.);
- (l). Bentuk penerbitan, jika berkaitan, diikuti dengan tanda noktah (.);
- (m). Menulis rujukan hendaklah diakhiri dengan tanda noktah (.)

### 3.6 Format Menulis Rujukan

Rujukan hendaklah ditulis dalam senarai rujukan mengikut format berikut dengan inden bergantung (hanging indent) sebanyak 0.25 inci:

Nama penulis (Tahun). Tajuk. Jurnal. Bil. hlm.

#### 3.6.1 Contoh-contoh Format Rujukan

##### 3.6.1.1 Pengarang Perseorangan dan Kumpulan

Contoh untuk satu pengarang:

Paredis, J. (1993). Genetic State-Space Search for Constraint Optimization Problems. Proc. Of the 13th Int. Joint Conf. on Artificial Intelligence (IJCAI93). San Mateo, USA: Morgan Kaufman.

Contoh untuk dua atau lebih pengarang:

Puget, J.F and Albert, P. (1994a). SOLVER: Constraints? Objects Descriptions. Technical Report. ILOG S. A.



Puget, J. F. and Albert, P. (1994b). AC++ Implementation of CLP. Technical Report. ILOG S.A.

Pergantis, S. A., Cullen, W.R., Chow, D.T. and Elgendor, G. K. (1997). Liquid Chromatography and Mass Spectrometry for the Speciation of Arsenic Animal Feed Additives. Journal of Chromatography A. 764. 211 - 222.

***ATAU ditulis seperti berikut:***

Pergantis, S.A., Cullen, W.R., Chow, D.T. and Elgendor, G. K. (1997). Liquid Chromatography and Mass Spectrometry for the Speciation of Arsenic Animal Feed Additives. Journal of Chromatography A. Bil. 764. m.s. 211-222.

**3.6.1.2 Penyunting/Penyusun**

*Contoh:*

Martin, A.M. (Ed.) (1991). Peat As an Agent in Biological Degradation of Waste. London: Elsevier. 314 - 362.

Lees, R. H. and Thomas T.R., (Eds.) (1974). Chemical Nomenclature Usage. Chichester: Ellis Horwood.

**3.6.1.3 Penulis/Penyunting Korporat**

*Contoh:*

Engineers Joint Council (1969). Thesaurus of Engineering and Scientific terms. New York: Engineers Joint Council.

American Chemical Society (Ed.) (1978). Handbook for Authors of American Chemical Society Publications. Washington, D.C.: American Chemical Society.

**3.6.2 Jenis Bahan Rujukan**

Dalam penulisan laporan, penulis akan merujuk berbagai jenis bahan sumber. Contoh berikut adalah sebagai panduan untuk menulis bahan rujukan mengikut jenisnya ke dalam senarai rujukan.

i). Buku

Nama penulis (Tahun). Judul Buku. Edisi. Tempat terbit: Penerbit. m.s.

*Contoh:*

Theusen, G. J. and Fabrycky, W. J. (1984). Engineering Economy. 6th. Ed. Englewood Cliffs, N. J.: Prentice Hall. 150-178.

ii). Artikel dalam buku

Nama pengarang artikel (Tahun). Judul Artikel. dlm. Nama pengarang buku. Judul Buku. Tempat terbit: Penerbit. hlm.

Contoh:

Sarmani, S. (1987). Pencemaran Radioaktif. Dlm. Mohamad, A.B. "Perspektif Persekitaran." Petaling Jaya: Fajar Bakti. 71-87.

iii). Artikel dalam jurnal

Nama penulis (Tahun). Judul Artikel. Judul Jurnal. Jilid (nombor). Hlm.

Contoh:

Mikac, N. and Branica, M. (1994). Complexation of Trialkyllead with Diethyldithiocarbonate. Electroanalysis. 6. 37-43.

iv). Tesis

Nama Penulis (Tahun). Judul. Tesis, Nama Institusi.

Contoh:

Desa, M.I (1995). Bus fleet maintenance modeling in a developing country. Ph.D Thesis, University of Salford.

v). Perundangan

Nama negara (Tahun). Judul Perundangan.: Nombor perundangan.

Contoh:

Malaysia (1983). Perintah Monumen Lama dan Tapak Tanah Bersejarah.: P.U. (A)41 983.

vi). Piawai

Nama institusi (Tahun). Judul Piawai. Tempat terbit: (Nombor piawai)

Contoh:

British Standards Institution (1987). Tongued And Grooved Software Flooring. London: (BS 1297).

vii). Paten

Nama pemunya (Tahun). Judul Paten. (Nombor paten).

Contoh:

Lindgren, E. A. (1960). Screen Room Air Inlet and Wave Guard. (U.S. Patent 2,925, 457).

viii). Katalog dagang

Nama pengeluar (Tahun). Judul. Tempat terbit: Nota.

Contoh:

Howick partitioning Ltd. (1984). Howick: Partitioning in Business. Redhil (U.K.): Trade brochure.

Sila rujuk **Appendix S** untuk contoh senarai rujukan mengikut sistem pengarang dan tahun.

### 3.6.3 Rujukan Dari Internet

Walaupun Internet menyediakan sumber rujukan yang amat luas, kadangkala adalah sukar untuk memetik laman web sebagai rujukan kerana maklumat yang diperlukan adalah dari kawasan laman web yang berbeza. Selain itu, maklumat dalam Internet biasanya tidak kekal dan sentiasa mengalami pembaharuan dari semasa ke semasa. Oleh itu, beberapa maklumat, seperti pengarang atau tarikh penerbitan boleh menjadi sukar untuk dikenalpasti. Apabila merujuk laman web yang berubah dari masa ke semasa, adalah penting untuk membuat catatan mengenai tarikh akses laman web tersebut beserta dengan alamat laman web tersebut.

### 3.6.3.1 Laman Web

#### *Penggunaan dalam teks*

Penulis hendaklah memetik nama pengarang / badan pengarang beserta dengan tarikh dicipta atau tarikh akhir disemak.

Contoh:

(International Narcotics Control Board 1999)

#### *Dalam Senarai Rujukan*

Penulis hendaklah memasukkan maklumat berikut:

- (i). Penulis (sama ada individu atau organisasi yang bertanggungjawab untuk laman web tersebut)
- (ii). Tahun (tarikh laman web dicipta atau tarikh akhir dikemaskini) (iii) Nama penaja laman web (sekiranya ada)
- (iii). Tarikh akses (hari bulan tahun)
- (iv). URL atau alamat Internet yang lengkap dan diletakkan dalam kurungan tajam (<>)

Contoh:

International Narcotics Control Board 1999, United Nations, accessed 1 October 1999, <<http://www.incb.org>>

### 3.6.3.2 Petikan dari muka surat atau dokumen dalam laman web

#### *Penggunaan dalam teks*

Penulis hendaklah memasukkan maklumat nama penulis atau badan pengarang beserta dengan tarikh dokumen tersebut dicipta atau tarikh akhir dikemaskini.

Contoh:

(Winston 1999) atau: (World Health Organisation 2013)

#### *Dalam Senarai Rujukan*

Penulis hendaklah memasukkan maklumat berikut:

- i). Penulis (sama ada individu atau organisasi yang bertanggungjawab untuk laman web tersebut)
- ii). Tahun (tarikh laman web dicipta atau tarikh akhir dikemaskini)
- iii). Tajuk - dalam huruf condong (*italic*)
- iv). Nama penaja laman web (sekiranya ada)

v). Tarikh akses (hari bulan tahun)

vi). URL atau alamat Internet yang lengkap dan diletakkan dalam kurungan tajam (<>)

Contoh:

Winston, J 1999, A look at referencing, AAA Educational Services, accessed 20 October 2002, <<http://www.aaa.edu.au/aaa.html>>. United Nations Web Services 2006, World Health Organisation 2013, Financial crisis and global health, The United Nations, accessed 1 August 2013, <[http://www.who.int/topics/financial\\_crisis/en/](http://www.who.int/topics/financial_crisis/en/)> \_

### **3.6.3.3 Laman Web tanpa Penulis**

*Petikan dalam teks*

Sekiranya nama penulis untuk sesuatu laman web tidak diketahui, petikan laman web hendaklah mengandungi tajuk laman web beserta tarikh dicipta.

Contoh:

(Improve indigenous housing 2007)

*Dalam Senarai Rujukan*

Contoh:

Improve indigenous housing now, government told, 2007. accessed 8 February 2009, <<http://www.architecture.com.au/i-cms?page=10220>>

### **3.6.3.4 Laman Web tanpa Tarikh**

*Petikan dalam teks*

Sekiranya tarikh untuk sesuatu laman web tidak diketahui, guna singkatan n.d. (no date).

Contoh:

(ArtsNSW n.d.)

*Dalam Senarai Rujukan*

Contoh:

ArtsNSW n.d., New South Wales Premier's Literary Awards, NSW Department of the Arts, Sport and Recreation, accessed 19 June 2007, <<http://www.arts.nsw.gov.au/awards/LiteraryAwards/litawards.htm>>

### 3.6.3.5 Jurnal Dalam Talian

#### *Penggunaan dalam teks*

Penulis hendaklah memasukkan maklumat nama penulis beserta dengan tarikh dokumen tersebut dicipta.

Contoh:

(Morris 2004)

#### *Dalam Senarai Rujukan*

Penulis hendaklah memasukkan maklumat berikut:

Nama penulis beserta singkatan

- i). Tajuk artikel(diletak antara single quotation marks)
- ii). Tajuk jurnal dalam huruf condong (italic)
- iii). Maklumat penerbitan
- iv). Tarikh akses (hari bulan tahun)
- v). URL atau alamat Internet yang lengkap dan diletakkan dalam kurungan tajam (<>)

Contoh:

Morris, A 2004, 'Is this racism? Representations of South Africa in the Sydney Morning Herald since the inauguration of Thabo Mbeki as president'. Australian Humanities Re- view, Issue 33, August - October 2004, accessed 11 May 2007, <<http://www.australianhumanitiesreview.org/archive/Issue-August-2004/morris.html>>.

### 3.6.3.6 Buku Elektronik (E-Book)

#### *Penggunaan dalam teks*

Petikan hendaklah disebut seperti buku yang dicetak.

Contoh:

(Lloyd 2005)

#### *Dalam Senarai Rujukan*

Penulis hendaklah memasukkan maklumat berikut:

- i). Nama penulis atau editor.
- ii). Tarikh penerbitan
- iii). Tajuk dalam huruf condong (italic)
- iv). Format buku elektronik
- v). Tarikh akses (hari bulan tahun)
- vi). URL atau alamat Internet yang lengkap dan diletakkan dalam kurungan tajam (<>)

Contoh:

Lloyd, CB (ed.) 2005, Growing up global: The changing transitions for adulthood in developing countries, e-book, accessed 5 May 2007, <  
<http://www.nap.edu/books/11174/html/index.html>>

### 3.6.3.7 Suratkhobar

*Keratan akhbbar dari pangkalan data elektronik beserta nama penulis*

- Penggunaan dalam teks

Contoh:

(Pianin 2001)

Dalam Senarai Rujukan

Penulis hendaklah memasukkan maklumat berikut:

- i). Nama penulis.
- ii). Tahun artikel diterbitkan
- iii). Tajuk suratkhobar dalam huruf condong (*italic*)
- iv). Tarikh artikel diterbitkan (hari, bulan, tahun, muka surat - sekiranya ada)
- v). Tarikh akses (hari bulan tahun)
- vi). URL atau alamat Internet yang lengkap dan diletakkan dalam kurungan tajam (<>)
- vii). nama pangkalan data
- viii). nombor item (sekiranya ada)

Contoh:

Pianin, E 2001, As coal's fortunes climb, mountains tremble in W.Va; energy policy is transforming lives, The Washington Post, 25 February 2001, p. A03, accessed March 2001 from Electric Library Australasia

*Keratan akhbbar dari pangkalan data elektronik tanpa nama penulis*

- Penggunaan dalam teks

Contoh 1:

(New York Daily Times 1830)

Contoh 2:

An account of the popularity of the baby tapir in The Independent (2013) stated that . . .

Dalam Senarai Rujukan

Sekiranya tiada nama penulis, tajuk keratan akhbar hendaklah disenarai dahulu.

Contoh:

Amending the Constitution, New York Daily Times, 16 October 1851, p. 2, accessed 15 July 2007 from ProQuest Historical Newspapers database.

Baby tapir wins hearts at zoo, The Independent, 9 August 2013, Accessed 25 January 2014, <<http://www.independent.ie/world-news/and-finally/baby-tapir-wins-hearts-at-zoo-30495570.html>>

*Keratan akhbar atas talian*

- Penggunaan dalam teks

Contoh:

(Coorey 2007)

Dalam Senarai Rujukan

Sekiranya tiada nama penulis, tajuk keratan akhbar hendaklah disenarai dahulu.

Contoh:

Coorey, P 2007, Costello hints at green safety net, Sydney Morning Herald, 10 May, accessed 14 May 2012, <<http://www.smh.com.au/news/business/costello-hints-at-green-safety-net/2007/05/09/1178390393875.html>>



## **CHAPTER 4. PANDUAN PENULISAN NOTA DAN NOTA KAKI**

### **4.1 Panduan Umum**

Nota ialah maklumat tambahan yang dimuatkan dalam sebuah penulisan. Nota kaki dibenarkan dan diletakkan di bahagian bawah sesuatu halaman. Ia digunakan untuk menerangkan atau memberi maklumat tambahan mengenai perkara yang terdapat dalam kandungan teks pada halaman berkenaan. Nota kaki dicatatkan mengikut angka Arab dan menurut urutan iaitu 1, 2, 3 dan sebagainya

### **4.2 Keseragaman Penulisan**

Cara penulisan nota kaki berbeza dengan penulisan rujukan dalam aspek penyebutan nama penulis dan penggunaan jenis tanda bacaan. Dalam nota kaki, nama penulis ditulis menurut sebutan dan susunan semula jadi nama berkenaan. Tanda bacaan koma atau tanda kurungan digunakan untuk memisahkan nama penulis, judul artikel dan maklumat penerbitannya. Dalam penulisan rujukan, tanda noktah digunakan bagi tujuan ini. Saiz taip huruf nota kaki adalah 10 pt. Perbezaan antara nota kaki dengan rujukan dapat dilihat daripada format berikut:

## **PART II : BACHELOR PROJECT**

### **CONTENTS GUIDE**

***BITC/BITZ : COMPUTER NETWORKING/COMPUTER  
SECURITY***

PROJECT TYPE I: SYSTEM DEVELOPMENT

## CHAPTER 1. INTRODUCTION

### 1.1 Introduction

Introduction to your project and your project background as a whole but in brief.

### 1.2 Problem statement (PS)

- Description of problems that directly influence the motives of the project. (Example, explanation of problems of "Battery phone drainage in android wireless when connected to internet")
- Applicable for project of improving or solving a specific case.
- Project that is of new creation, re-creation, individual initiative or not specifically involves any case to deal with, the problems can be included in the preamble paragraphs.

Table 1.1: Summary of Problem Statement

PS	Problem Statement
PS <sub>1</sub>	Android wireless is always connected to the internet in on mode even in sleep mode which caused battery phone drain

- It is advisable to have only one problem statement in during this degree Final Year Project
- Summarize the problem statement into one concise statement and put it as in sample Table 1.1.

### 1.3 Project Question (PQ)

- The question arises from the problem statement and need to be answered in this project. Give brief explanation of the project question. You can have more than one 'project question', however maximum are only three (3) project questions.

- Summarize the project questions and put it as in sample Table 1.2.

Table 1.2: Summary of Project Question

PS	PQ	Project Question
PS <sub>1</sub>	PQ <sub>1</sub>	How can android wireless application programming help in this project?

#### 1.4 Project Objective (PO)

- Describe the things that you want to achieve in EACH of your project, based on the problem statement and project question that you have highlighted in Table 1.1 and Table 1.2.
- Summarize the project objectives and put it as in sample Table1.3.

Table 1.3: Summary of Project Objectives

PS	PQ	PO	Project Objective
PS <sub>1</sub>	PQ <sub>1</sub>	PO <sub>1</sub>	To study the android wireless application programming
		PO <sub>2</sub>	To develop android auto wireless connection application
		PO <sub>3</sub>	To test and verify the android wireless application in smart phone.

#### 1.5 Project Scope

- Describes every scope involved in your project and give reason(s) for the involvement. Examples: (e.g. Android wireless), specific devices (e.g. focus on battery consumption), other specific entities, specific platform (e.g. internet speed, android OS) etc.
- Summarize in point form format (use number bullets i.e. 1, 2, 3) together with a brief explanation.

#### 1.6 Project Contribution (PC)

- Describes who/what may benefits from the project and how? You can infer it back to your objectives.
- Describes what do you expected from your project and significant contribution of your project.
- Summarize the project contribution and put it as in sample Table 1.4.

Table 1.4: Summary of Project Contribution

PS	PQ	PO	PC	Project Contribution
PS <sub>1</sub>	PQ <sub>1</sub>	PO <sub>1</sub>	PC <sub>1</sub>	Proposed suitable programming language for android wireless application
		PO <sub>2</sub>	PC <sub>2</sub>	Proposed an algorithm for auto wireless connection.
		PO <sub>3</sub>	PC <sub>3</sub>	Proposed an android auto wireless application in smart phone.

## 1.7 Report Organisation

- Give a summary of each chapter presented in this report. For example:

### **Chapter 1: Introduction**

This chapter discuss about . . . . .

. . . . .

. . . . .

### **Chapter 7: Introduction**

. . . . .

## 1.8 Conclusion

- Give a summary of this chapter and next activities to be developed.

## CHAPTER 2. LITERATURE REVIEW

*(Notes: In this chapter you are expected to cite your work especially in 2.3 which is previous research for minimum of 20 citations and make sure to list it in your Reference list)*

### 2.1 Introduction

- Preview to the literature review of your project. Provide chapter outline diagram of your Literature Review.

### 2.2 Related Work/Previous Work

- Identify domain related to your project with explanations (Example of your domain is such as android, wireless, malware, intrusion etc.)
- Explain any issues related to your domain problem for example its plat- form, architecture, algorithm etc.
- You can provide any evidence or statistic which can help to verify your domain problem.
- Explain several terms that being used in your project.

### 2.3 Critical review of current problem and justification

- Discuss at least three methodologies (if it is related to your project) that being used in other research which is relate to your project title. Make some comparison to highlight the differences.
- Discuss at least three techniques that being used in other research which is relate to your project title. Make some comparison to highlight the differences.

- Discuss the parameter/attributes that being used in other research which is relate to your project title. Make some comparison to highlight the differences.
- Discuss at least three (3) software and hardware that being used in other research which is relate to your project title. Make some comparison to highlight the differences.
- Cite the source if you refer the approach from published materials.
- Conclude for the above fact and finding.

#### **2.4 Proposed Solution/further project**

- Based on the previous research, make some justification of selected methodology/ techniques/ parameter that you are going to use in your project.
- State references of selected methodology/ techniques/ parameter.
- Include statements (from published materials) that support the approach that you apply.

#### **2.5 Conclusion**

- Summarize the chapter and explain the next activities to be developed.



## **CHAPTER 3. PROJECT METHODOLOGY**

### **3.1 Introduction**

- Preview to the project methodology and how it would be carried out.

### **3.2 Methodology**

- Described each stages of the selected methodology and describe the activities that you will do in every stages and relate it with your project. Provide diagram of your project methodology.
- Examples: SDLC/OOAD, Top Down design approach, Rapid Development and relevant methodology

### **3.3 Project Milestones**

- Explain your actions plan prior to the end of the project. Apply from what you have learnt from project management.
- List and describe stage by stage of your activities.
- Attach your project time line or Gantt chart (in 1 page view)

### **3.4 Conclusion**

- Summarize the chapter and explain the next activities to be developed.

## **CHAPTER 4. ANALYSIS AND DESIGN**

### **4.1 Introduction**

Introductory preview to this chapter. Examples: this chapter defines the results of the analysis of the preliminary design and the result of the detailed design. Provide chapter outline diagram of Chapter IV.

### **4.2 Problem Analysis**

- Investigate and describe current system scenario/situation. Reiterate the data flow diagram or activity diagram from your reference(s), showing how the current system(s) or business(s) runs. Use appropriate diagram to visualize the system flow such as sequence diagram (if use OOAD with UML), DFD (if use SSADM) and Flowchart (for network project). For simulation based project, analyse the real graph given by company.
- Explain in detail the problems statement as mentioned in Chapter 1

### **4.3 Requirement analysis**

#### **4.3.1 Data Requirement**

- What data should the system input and output, and what data should the system store internally.
- It can be illustrated by using Data Model or Data Dictionary.

#### **4.3.2 Functional Requirement**

- Specify the functions of the system, how it records, compute, trans- forms, and transmits data.
- It can be illustrated by using DFD, Context diagram or Use case.

### 4.3.3 Non-functional Requirement

Specify how well the system performs its intended functions. E.g. Quality requirement, Performance-how many computer resources should it use, how accurate should the result be, how much data should it be able to store?

### 4.3.4 Others Requirement

Describe each of software, hardware and requirements that will be used (justification of usage).

## 4.4 High-Level Design

Describe high-level view of your system's structure or system's interior. You may refine some of the function below once you are in PSM II.

### 4.4.1 System Architecture

- Define architecture view of your system. The architecture view can be present in layer, framework, and tier or patent (for OOAD).
- Describe the static view and dynamic view of your application (for OOAD - use interaction diagram, high-level class diagram).
- For those use SSADM: use any appropriate diagram to view your system.

### 4.4.2 User Interface Design

- Refine your user interface design that defined in chapter 5 of PSM I.

#### (a). Navigation Design

Define and refine the navigation flow and types of navigation controls.

#### (b). Input Design

- Define and refine the screens (e.g. Types of inputs such as text, numbers, and selection box etc.) used to enter information, as well as any forms on which users write or type information.
- Define and refine validation rule for each of input field.

#### (c). Output Design

Define and refine the types of outputs including detail reports, summary reports, turnaround documents and graphs. Classify your output in term of periodically or ad-hoc basis. For example daily, monthly, yearly etc.

### 4.4.3 Database Design

#### 4.4.3.1 Conceptual and Logical Database Design

- Introduce briefly to the logical data model (LDM) or entity relationship diagram (ERD) and what they have to do with your database design.
- Define, refine and construct the entity relationship (ER) diagrams in details with explanation in text on what basis (business rules) you apply for every entity relationship you have defined in the diagram.
- Data dictionary and normalization

### 4.5 Detailed Design

Specification and diagrams may be further elaborated. Emphasis should be on the logic of the design and the approach to satisfying the requirements –How will the system function?

#### 4.5.1 Software Design

- For those use SSADM/SDLC: Describe in detail of every functions according to your DFD in format of program specification. The program specification includes information of program description, file input/output, pseudo code and attach sample screens.
- For those use OOAD/UML: Describe in detail of every classes. Examples: class name, responsibility, attributes methods/operations. Describes every methods/operations such as its responsibility, input/output parameter, pre/post condition and algorithm – should be bias to language chosen for your software development (e.g. In English like of Java code).

#### 4.5.2 Physical Database Design

Translate logical to target DBMS (use DDL/DCL) - base tables, design for other business rules (constraint- validation for fields, records), file organization and indexes.

### 4.6 Conclusion

Summarize the chapter and explain the next activities to be developed

## **CHAPTER 5. IMPLEMENTATION**

### **5.1 Introduction**

- Introductory preview to this chapter.
- Briefly describe the activity involved in the implementation phase and what is the expected output after you complete this phase. Provide chapter outline diagram of Chapter V.

### **5.2 Software Development Environment setup**

- Define your development environment setup.
- Use diagram to view/present the environment architecture. Examples: deployment diagram, draw the software (client s/w, server s/w), hardware (server configuration e.g. Port no., IP address, database instance name, table space etc.) and network setup.

### **5.3 Software Configuration Management**

#### **5.3.1 Configuration environment setup**

- Explain how you design and setup the configuration management in your project. Do not explain on how to install the software.
- Explain (if any) the software tools used to support your configuration control. E.g. Visual SourceSafe, CVS etc.

#### **5.3.2 Version Control Procedure**

Describe the procedure and control in managing your source code version.

## **5.4 Implementation Status**

Describe the progress of the development status for each of the component/module. For example: component/module name, description, duration to complete, date completed, size of software etc.

## **5.5 Conclusion**

Summarize the chapter and explain the next activities to be developed.

## **CHAPTER 6. TESTING**

### **6.1 Introduction**

Introductory preview to this chapter. E.g. Briefly describe the activity involved in testing phase and what is the testing strategy to be adopted in your project. Provide chapter outline diagram of Chapter 4.

### **6.2 Test Plan**

#### **6.2.1 Test Organization**

Describe personnel involved.

#### **6.2.2 Test Environment**

- Describe the location/environment of testing to be carried out.
- Define hardware, firmware configurations, preparations and training prior to testing.

#### **6.2.3 Test Schedule**

Define how many cycles and duration of your test to be conducted.

### **6.3 Test Strategy**

Explain the strategy to be selected such as bottom-up or top-down and black-box/white-box classes of tests.

#### **6.3.1 Classes of tests**

Output correctness or functionality test, Security test, Stress test and etc.

## **6.4 Test Design**

### **6.4.1 Test Description**

Test case identification, test cases and expected result for each module are designed and documented.

### **6.4.2 Test Data**

Real life or synthetic data will be selected.

## **6.5 Test Results and Analysis**

- Test case identification, tester identification, test case results (Success/Fail), and detailed documentation on the failed test case.
- How satisfied overall your intended users and yourself with the system.

## **6.6 Conclusion**

Summarize the chapter and explain the next activities to be developed.



## **CHAPTER 7. PROJECT CONCLUSION**

### **7.1 Introduction**

Introductory preview to this chapter.

### **7.2 Project summarization**

Summarise your project by stating its objectives. Describe how the objective has been achieved by integrating the information that you have reported in implementation and testing phase. Conclude the significant result that you have gained in this project. State the weaknesses and strength of your project

### **7.3 Project Contribution**

- State your project contribution to the university/faculty/company/individual. Your contribution must be aligned with the contribution that you have mentioned in Chapter 1.
- State where to find the user manual - e.g. Appendix XX

### **7.4 Project Limitation**

State your project limitation.

### **7.5 Future Works**

- Present your suggestions on how your system can be improved better.
- Elaborate each of your suggestions in paragraph.

## 7.6 Conclusion

- State whether you think your project meets your set objectives conclusively.
- Concluding phrases to conclude the project.

## **REFERENCES**

- A list of references used in the project report such as journals, articles, books and etc. as directly quoted in the report.
- For complete reference, please refer to Final Year Project Writing Guide 2019.

## **BIBLIOGRAPHY**

- A list of references used in the project report such as journals, articles, books and etc. but not directly quoted in the report.
- For complete reference, please refer to Final Year Project Writing Guide 2019.

## **APPENDICES**

- E.g. user guide, user manual, diagrams and etc.

## PROJECT TYPE II: ANALYSIS (SIMULATION AND TESTBED)

## CHAPTER 1. INTRODUCTION

### 1.1 Introduction

Introduction to your project and your project background as a whole but in brief.

### 1.2 Problem statement (PS)

- Description of problems that directly influence the motives of the project. (Example, explanation of problems of “Battery phone drainage in android wireless when connected to internet”)
- Applicable for project of improving or solving a specific case.
- Project that is of new creation, re-creation, individual initiative or not specifically involves any case to deal with, the problems can be included in the preamble paragraphs.
- It is advisable to have only one problem statement in during this degree Final Year Project
- Summarize the problem statement into one concise statement and put it as in sample Table 1.1.

Table 1.1: Summary of Problem Statement

PS	Problem Statement
PS <sub>1</sub>	Difficulties in identifying malware behaviour in android

### 1.3 Project Question (PQ)

- The question arises from the problem statement and need to be answered in this project. Give brief explanation of the project question. You can have more than one ‘project question’, however maximum are only three (3) project questions.

- Summarize the project questions and put it as in sample Table 1.2.

Table 1.2: Summary of Project Question

PS	PQ	Project Question
PS <sub>1</sub>	PQ <sub>1</sub>	How do we know it is a malware attack?
	PQ <sub>2</sub>	How to extract the attack pattern?

#### 1.4 Project Objective (PO)

- Describe the things that you want to achieve in EACH of your project, based on the problem statement and project question that you have high- lighted in Table 1.1 and Table 1.2.
- Summarize the project objectives and put it as in sample Table 1.7.

Table 1.3: Summary of Project Objective

PS	PQ	PO	Project Objective
PS <sub>1</sub>	PQ <sub>1</sub>	PO <sub>1</sub>	To generate the attack, pattern of android malware
	PQ <sub>2</sub>	PO <sub>2</sub>	To develop the procedure of extracting the attack pattern
		PO <sub>3</sub>	To test the script on extracting the attack pattern

#### 1.5 Project Scope

- Describes every scope involved in your project and give reason(s) for the involvement. Examples: (e.g. Android wireless), specific devices (e.g. focus on battery consumption), other specific entities, specific platform (e.g. internet speed, android OS) etc.
- Summarize in point form format (use number bullets i.e. 1, 2, 3) together with a brief explanation.

#### 1.6 Project Contribution (PC)

- Describes who/what may benefits from the project and how? You can infer it back to your objectives.
- Describes what do you expected from your project and significant contribution of your project.
- Summarize the project contribution and put it as in sample Table 1.4.

Table 1.4: Summary of Project Contribution

PS	PQ	PO		Project Objective
PS <sub>1</sub>	PQ <sub>1</sub>	PO <sub>1</sub>	PC <sub>1</sub>	Classification of android malware behaviour
			PC <sub>2</sub>	Proposed the general android malware's attack
	PQ <sub>2</sub>	PO <sub>2</sub>	PC <sub>3</sub>	Proposed technique to extract the malware attack.
		PO <sub>3</sub>		

## 1.7 Report Organisation

- Give a summary of each chapter presented in this report. For example:

### Chapter 1: Introduction

This chapter discuss about . . . . .

. . . . .

. . . . .

### Chapter 7: Introduction

. . . . .

## 1.8 Conclusion

Give a summary of this chapter and next activities to be developed.

## CHAPTER 2. LITERATURE REVIEW

*(Notes: In this chapter you are expected to cite your work especially in 2.3 which is previous research for minimum of 20 citations and make sure to list it in your Reference list)*

### 2.1 Introduction

Preview to the literature review of your project. Provide chapter outline diagram of your Literature Review.

### 2.2 Related Work/Previous Work

- Identify domain related to your project with explanations (Example of your domain is such as android, wireless, malware, intrusion etc.)
- Explain any issues related to your domain problem for example its platform, architecture, algorithm etc.
- You can provide any evidence or statistic which can help to verify your domain problem.
- Explain several terms that being used in your project.

### 2.3 Critical review of current problem and justification

- Discuss at least three methodologies (if it is related to your project) that being used in other research which is relate to your project title. Make some comparison to highlight the differences.
- Discuss at least three techniques that being used in other research which is relate to your project title. Make some comparison to highlight the differences.



- Discuss the parameter/attributes that being used in other research which is relate to your project title. Make some comparison to highlight the differences.
- Discuss at least 3 software and hardware that being used in other research which is relate to your project title. Make some comparison to highlight the differences.
- Cite the source if you refer the approach from published materials.
- Conclude for the above fact and finding.

## **2.4 Proposed Solution/further project**

- Based on the previous research, make some justification of selected method- ology/ techniques/ parameter that you are going to use in your project.
- State references of selected methodology/ techniques/ parameter.
- Include statements (from published materials) that support the approach that you apply.

## **2.5 Conclusion**

Summarize the chapter and explain the next activities to be developed.

## **CHAPTER 3. PROJECT METHODOLOGY**

### **3.1 Introduction**

Preview to the project methodology and how it would be carried out.

### **3.2 Methodology**

- Described each stages of the selected methodology and describe the activities that you will do in every stage and relate it with your project. Draw framework of your project methodology.
- Analysis category: experimental, testbed, simulation, pilot test, survey.
- How data is collected.
- It can be either by making questionnaire or interview.
- Make an appropriate questionnaire/interview and it MUST be approved by your supervisor. The questionnaire/interview are filled by the client (minimum 20% per sample)
- All forms of data collection must be attached by appendix.
- Make data collection by using appropriate software such as MRTG, Ethereal and so on.

### **3.3 Project Milestones**

- Explain your actions plan prior to the end of the project. Apply from what you have learnt from project management.
- List and describe stage by stage of your activities.
- Attach your project time line or Gantt chart (in 1 page view)

### **3.4 Conclusion**

Summarize the chapter and explain the next activities to be developed.

## CHAPTER 4. DESIGN

*(Note: As for simulation project, you need to map the actual design into the simulation applications such as Opnet or NS2.)*

### 4.1 Introduction

Introductory preview to this chapter. Examples: this chapter defines the results of the analysis of the preliminary design and the result of the detailed design. Provide chapter outline diagram of Chapter IV.

### 4.2 Network System Architecture

- Describes the overall system in “the big picture”.
- Discusses interfaces, network assumptions, nodes, router and as appropriate.

### 4.3 Logical and Physical Design

Refer to what you have learnt from network major courses.

### 4.4 Possible Scenarios

- Define two possible scenarios plus with the existing system stated in chapter IV and make justification for each scenarios.
- Discuss on how to simulate the project
- For each scenario, you are required to include the design as well.

### 4.5 Security Requirement (optional)

State the security requirements and the implementation approach.

#### **4.6 Metric Measurement**

Define the metric used in the project.

#### **4.7 Conclusion**

Summarize the chapter and explain the next activities to be developed

## **CHAPTER 5. IMPLEMENTATION**

### **5.1 Introduction**

- Introductory preview to this chapter.
- Briefly describe the activity involved in the implementation phase and what is the expected output after you complete this phase. Provide chapter outline diagram of Chapter V.

### **5.2 Environment Setup**

- List and explain the parameters, variables, and assumptions used in the project.
- Exclude steps on hardware/software installation and configuration.

### **5.3 Conclusion**

Summarize the chapter and explain the next activities to be developed.

## **CHAPTER 6. TESTING AND ANALYSIS**

### **6.1 Introduction**

Introductory preview to this chapter. E.g. briefly describe the activity involved in the implementation phase in your simulation/testbed project. Provide chapter outline diagram of Chapter 4.

### **6.2 Results and Analysis**

- This section should consist of graphical results using the collected data from the implementation phase.
- A critical analysis on the graphical results should also be represented in this section.

### **6.3 Conclusion**

Summarize the chapter and explain the next activities to be developed.

## **CHAPTER 7. PROJECT CONCLUSION**

### **7.1 Introduction**

Introductory preview to this chapter.

### **7.2 Project summarization**

Summarise your project by stating its objectives. Describe how the objective has been achieved by integrating the information that you have reported in implementation and testing phase. Conclude the significant result that you have gained in this project. State the weaknesses and strength of your project

### **7.3 Project Contribution**

- State your project contribution to the university/faculty/company/individual. Your contribution must be aligned with the contribution that you have mentioned in Chapter 1.
- State where to find the user manual - e.g. Appendix XX

### **7.4 Project Limitation**

State your project limitation.

### **7.5 Future Works**

- Present your suggestions on how your system can be improved better.
- Elaborate each of your suggestions in paragraph.



## 7.6 Conclusion

- State whether you think your project meets your set objectives conclusively.
- Concluding phrases to conclude the project.

## **REFERENCES**

- A list of references used in the project report such as journals, articles, books and etc. as directly quoted in the report.
- For complete reference, please refer to Final Year Project Writing Guide 2019.

## **BIBLIOGRAPHY**

- A list of references used in the project report such as journals, articles, books and etc. but not directly quoted in the report.
- For complete reference, please refer to Final Year Project Writing Guide 2019.

## **APPENDICES**

- E.g. user guide, user manual, diagrams and etc.

## ***BITD: DATABASE MANAGEMENT***

## **CHAPTER 1. INTRODUCTION**

### **1.1 Introduction**

Introduction to your project and your project background as a whole but in brief.

### **1.2 Problem statement(s)**

- Describes the problems and their consequences that calls for database management solutions. (For example: In the current system, data redundancy problem can be found in customer records. Consequently, the result of aggregate queries/report generated is inaccurate).
- Describe the possible causes of the problem. (For example: This problem is caused by poor database design where key constraint is not used to distinguish individual customer records).

### **1.3 Objective**

- States the objectives in bullet points form format together with a brief explanation.
- Maps the objectives with the problems stated in the previous section. (For example: Objective 1: To produce accurate customer reports by removing data redundancy problems through the enforcement of key constraints)

### **1.4 Scope (the boundary of your system)**

- Describes every scope involved in your project and give reason(s) for the involvement. Examples: (e.g. children education), specific users (e.g. children between 5 and 8), other specific entities, specific platform (e.g. network, OS) etc.
- Can be in point form format (use bullets) together with a brief explanation.

## 1.5 Project Significance

- Describes who/what may benefits from the project and how?

## 1.6 Expected Output

- Describes what you expect from your project. For example,  
*Output 1: Accurate monthly sales report in tabular format which can be printed through the system.*  
*Output 2: Sales monitoring screen for the administrator to keep track daily sales.*  
*Output 3: Multi-dimensional searching results screens which are generated based on join queries and sub-queries results*

## 1.7 Conclusion

Give a summary of this chapter and next activities to be developed.

## CHAPTER 2. PROJECT METHODOLOGY AND PLANNING

### 2.1 Introduction

Introductory preview to project methodology and planning.

### 2.2 Project Methodology

- Describe the Database life cycle (DBLC) phases related to the project.
- List and describe the tasks in DBLC phases and how do you plan to perform the tasks.

### 2.3 Project Schedule and Milestones

State the milestones of your project in form of a table. For example:

Milestones	Expected Documents	Dates
1. Problems identification and analysis	(a). Flow chart of the current system, (b). Flow chart of the proposed system, (c). DFD of the proposed system, (d). Requirement of the proposed system (Functional, non-functional and devices)	6-March-2015
2. Conceptual design of the proposed system	A complete ERD	21-March-2015
.....	.....	.....

Attach your project time line or Gantt chart (in 1 page view) illustrating the milestones and the project tasks identified in 2.3.

## **2.4 Conclusion**

Summarize the chapter and explain the next activities to be developed

## **CHAPTER 3. ANALYSIS**

### **3.1 Introduction**

Introductory preview to the analysis phase and how it would be developed.

### **3.2 Problem Analysis**

Investigate and describe current (as-is) system scenario/situation aided by suitable diagrams.

### **3.3 The proposed improvements/solutions**

Describe and illustrate the proposed improvements in form of a suitable diagram.

### **3.4 Requirement analysis of the to-be system**

#### **3.4.1 Functional Requirement (Process Model)**

- Specify the functions of the system, how it records, compute, transforms, and transmits data.
- It can be illustrated by using Data Flow Diagram (DFD), or UML related diagrams.

#### **3.4.2 Non-functional Requirement**

Specify how well the system performs its intended functions. For example, Quality requirement: how accurate should the result be, how secure is the system? Performance requirement: How fast is the query result?

#### **3.4.3 Others Requirement**

- Describe software that will be used (justification of usage).
- Describe hardware that will be used (justification of usage).



- Describe other requirements (justification of usage).

### **3.5 Conclusion**

Summarize the chapter and explain the next activities to be developed.

## **CHAPTER 4. DESIGN**

### **4.1 Introduction**

Introductory preview to this chapter.

### **4.2 Introductory preview to this chapter.**

Define architecture view of your system. The architecture view can be present in layer, framework, and tier or patent (for OOAD).

### **4.3 Database Design**

Briefly describe the main phases of database design and the expected output from each phase.

#### **4.3.1 Conceptual Design**

- Develop an Entity Relationship Diagram (ERD) or an object-relational models (UML Class Diagram)
- State clearly in the diagrams participation constraints and the relationship cardinality using suitable notations.
- Describe the relationships (and the participation constraints) in form of business rules.

#### **4.3.2 Logical Design**

- Develop a data dictionary and validate the conceptual design using normalization/user transaction (through sample data/sample transaction).
- Query design: Describe the types of queries that will be used in the proposed system in form of relational algebra or SQL statements. E.g. Aggregate queries, subqueries, join queries.

### **4.3.3 Physical Design**

- Describe the selection of DBMS
- Description of the usage of stored procedures, triggers, and other related database objects
- Describe security mechanism (privileges, passwords, user-level security)
- Describe database contingency (backup and recovery mechanism)

### **4.4 Graphical User Interface (GUI) Design**

Design and explain the navigation flow, input and output of the GUI according to the functional and non-functional requirement stated in Chapter 3.

### **4.5 Conclusion**

Summarize the chapter and explain the next activities to be developed

## **CHAPTER 5. IMPLEMENTATION**

### **5.1 Introduction**

- Introductory preview to this chapter.
- Briefly describe the activity involved in the implementation phase and what is the expected output after you complete this phase.

### **5.2 Software Development Environment Setup**

- Describe the system and database environment Setup (example: installation step, assigning admin login, starting the database services etc.)
- Describe database creation and database objects (tables, views, etc.) creation

### **5.3 Database Implementation**

- Present the DDL/DCL statements in the chosen DBMS for all database objects.
- Describe the implementation of main processes (stored procedures and triggers) using the selected programming language. You may show samples of the code you used.
- Describe data loading process (how do you populate the database)

### **5.4 Conclusion**

Summarize the chapter and explain the next activities to be developed.

## **CHAPTER 6. TESTING**

### **6.1 Introduction**

Introductory preview to this chapter. E.g. briefly describe the activity involved in testing phase and what is the testing strategy to be adopted in your project.

### **6.2 Test Plan**

#### **6.2.1 Test Organization**

Describe personnel involved.

#### **6.2.2 Test Environment**

- Describe the location/environment of testing to be carried out.
- Define hardware, firmware configurations, preparations and training prior to testing.

#### **6.2.3 Test Schedule**

- Define how many cycles and duration of your test to be conducted.

### **6.3 Test Strategy**

- Explain the strategy to be selected such as bottom-up or top-down and black-box/white-box classes of tests.

#### **6.3.1 Classes of tests**

Output correctness or functionality test, Security test, Stress test and etc.

## **6.4 Test Design**

### **6.4.1 Test Description**

Test case identification, test cases and expected result for each module are designed and documented.

### **6.4.2 Test Data**

Real life or synthetic data will be selected.

## **6.5 Test Results and Analysis**

- Test case identification, tester identification, test case results (Success/Fail), and detailed documentation on the failed test case.
- How satisfied overall your intended users and yourself with the system.

## **6.6 Conclusion**

Summarize the chapter and explain the next activities to be developed.

## **CHAPTER 7. CONCLUSION**

### **7.1 Introduction**

Introductory preview to this chapter.

### **7.2 Observation on Weaknesses and Strengths**

- State the weaknesses and strength of your project.
- You also may state other's responses regarding project topics.

### **7.3 Propositions for Improvement**

- Present your suggestions on how your system can be improved better.
- Elaborate each of your suggestions in paragraph.

### **7.4 Project Contribution**

- State your project contribution to the university/faculty/company/individual.
- State where to find the user manual - e.g. Appendix XX

### **7.5 Conclusion**

- State whether you think your project meets your set objectives conclusively.
- Concluding phrases to conclude the project.

## **REFERENCES**

- A list of references used in the project report such as journals, articles, books and etc. as directly quoted in the report.
- For complete reference, please refer to Final Year Project Writing Guide 2019.

## **BIBLIOGRAPHY**

- A list of references used in the project report such as journals, articles, books and etc. but not directly quoted in the report.
- For complete reference, please refer to Final Year Project Writing Guide 2019.

## **APPENDICES**

- E.g. user guide, user manual, diagrams and etc.



## ***BITE : GAME TECHNOLOGY***

## CHAPTER 1. INTRODUCTION

### 1.1 Project Background

- Description of your game – this should include the game genre, gameplay, purpose of the game (for serious game) and target groups.

### 1.2 Problem Statement

- Detail description of problem(s) or limitation(s) that you have identified in similar games or technology that are currently available.
- Problem statement can be disregarded if a project is a new creation, enhancement and innovation. The problems must be included in the *1.1 Project Background*.

### 1.3 Objectives

- Objectives are set of goals that are achievable and measurable at the end of the project.
- The objective can be in point form format (use bullets) together with a brief explanation.

### 1.4 Goals and Genre

- Briefly explain the goals and genre of your game.
- Example of goals: Entertainment, Recruitment & Training, Educational
- Example of genres: Adventure, Action, RPG, Action-Adventure.

## **1.5 Game Features**

- Explain the target players – this not necessarily specific age group. It could be a group of people with similar interests (e.g. Casual game may not have specific age group but it is normally played by non-gamers).
- Brief description on rules of the game, victory/termination condition and its gameplay.

## **1.6 Conclusion**

- Describe output(s) of your project.
- Give a summary of this chapter and next activities that will be covered in Chapter 2: Literature Review & Research Methodology.

## **CHAPTER 2. LITERATURE REVIEW AND PROJECT METHODOLOGY**

### **2.1 Introduction**

Preview to the literature review

### **2.2 Genre**

Identify and explain your game genre including its subgenres (if applicable).

### **2.3 Existing Games**

- Identify if there are any similar games that have been developed and how your game is different from other games.
- Identify the technology, hardware and software used in similar games related to your project.
- This may include discussion of past research (if applicable), references, case study and other findings that relate to your project.

#### **2.3.1 Comparison of Existing Games**

- Identify similar games that are currently available which are related to your project.
- The comparison should focus on the game features, gameplay, game mechanics and other relevant components of games – this may vary according to your chosen genre.
- At the end, you should highlight how your game is different compared to the existing games.

## **2.4 Project methodology**

- Describe the selected approach or methodology used in your project
- Examples: SDLC/Multimedia Production Process/Game Development Life Cycle (MDLC) or own model based on generic process
- Describe the activities that you may do in every stage and relate with your project.
- This may include a diagram illustrate the flow of your project plan and activities.

## **2.5 Conclusion**

- Summarize the chapter
- Explain the next activities that will be discussed in Chapter 3: Analysis

## **CHAPTER 3. ANALYSIS**

### **3.1 Requirement Analysis**

#### **3.1.1 Project Requirement**

- Analyse and discuss the differences of similar games that are related to your project.
- The analysis on similar games to your project should be discussed based on the game features of your chosen genre as below:
  - player roles
  - gameplay,
  - victory condition,
  - core mechanic (e.g. lives, energy, powerups, collectibles, time, score, inventory and etc.)
  - level progression - pacing including mapping, setting and emotional tone (if applicable),
  - user interface features/interaction models (e.g. avatar)
  - camera models,
  - storyline (if applicable),

#### **3.1.2 Technical Requirement**

- Define the hardware and related technologies (e.g. game engines) that you will use in this project. The purpose is to establish baseline technical capabilities and estimate development cost, effort and implications.

#### **3.1.3 Software Requirement**

- List software requirement in point form.
- This can be divided into game engine, game development tool and game art

- Example : Unity, Adobe After Effect, Autodesk Maya, Adobe Audition, 3D Studio Max and related software for developing the end product.

#### **3.1.3.1 Hardware Requirement**

- List hardware requirement in point form.
- This can be divided into development and player interaction
- Example: graphic tablet, Smartphone(Android/IOS/Windows), Kinect, joystick, oculus rift and etc.

#### **3.1.3.2 Other requirement (if applicable)**

- Specify other requirements to be used in your project such as you need special lab for project development.

### **3.2 Project Schedule and Milestone**

- Explain the project milestone and its status based on the activities listed in the milestone
- Apply what you have learnt from project management.
- Include your milestone and Gantt chart of your project.

### **3.3 Conclusion**

- Summarize the chapter
- Explain the next activities that will be discussed in Chapter 4: Design

## CHAPTER 4. DESIGN

### 4.1 Introduction

Introductory preview to this chapter.

### 4.2 Game Architecture

Describes the overall system in “the big picture”. Provide suitable diagram for the architecture.

### 4.3 Game Design

#### 4.3.1 Gameplay

- Describe the hierarchy of challenges of your games consists of atomic challenges, submission, mission and complete game (example: as Figure 1)
- Discuss the player roles, games rules and its victory/termination conditions
- Describe the level of difficulty of your game – skill, stress or absolute difficulty

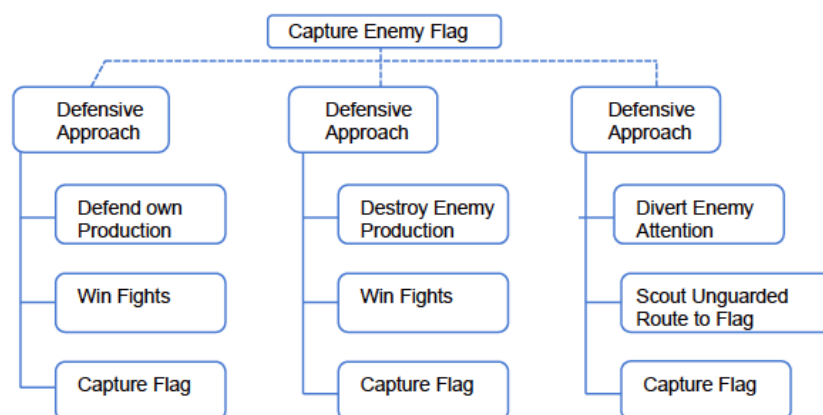


Figure 4.1: Example of Hierarchy of Challenge



#### **4.3.2 Core mechanics**

Explain the core mechanics of your game - lives, energy, powerups, collectibles, time, score, inventory and other relevant mechanic that is applicable to your game.

#### **4.3.3 Flowboard**

Draw and elaborate your flowboard

#### **4.3.4 Level Progression**

- Description of the pacing in each level of your game.
- This includes the risks and rewards in each level.

#### **4.3.5 Storyline (if applicable)**

- Describe the story and explain how the story relates to your gameplay and its level design.

#### **4.3.6 User Interface / Interaction Model**

- Description of screen layout (including shell menus) and its navigation structure.
- Describe the game platform, control mechanism and gaming devices for the player.
- Describe how ideas on paper are transformed into digital.

### **4.4 Game Art**

Description of the art pipeline of your game. This refers to the process of designing your game assets in 2D/3D.

#### **4.4.1 Game World**

- Description of the game world (e.g. era, year, location, etc.).
- Include sketches of your game world.
- Describe how ideas on paper are transformed into digital.

#### **4.4.2 Character Design**

- Description of the character (e.g. age, gender, physical attribute, etc.)
- Provide the details of each character (sketch) – side view, front view and back view.
- Describe how ideas on paper are transformed into digital.

#### **4.4.3 Camera Model**

- Describe how you want player to view the world – first person perspective, third person perspective, aerial perspectives and other 2D display options (e.g. single screen, side scrolling and etc.)
- Sketches is optional

#### **4.4.4 Audio/Sound Effect**

- Describe type of audio that will be used in your game
- Include dialog and voiceover narration (if applicable)

#### **4.5 Conclusion**

- Summarize the chapter
- Explain the next activities that will be discussed in Chapter 5: Implementation

## **CHAPTER 5. IMPLEMENTATION**

### **5.1 Introduction**

- Briefly describe the activity involved in the implementation phase and what is the expected output after you complete this phase.
- This chapter is based on what you have discussed in 4.4 Game Art. However, in this chapter, the discussion focuses on conversion and intergration of the game art.

### **5.2 Creation of Game Art**

This is based on your 2D or 3D pipeline

#### **5.2.1 Production of Graphics**

- Describe in details the steps of producing the game characters and its game world.
- Explain either uses the bitmap or vector, extracting digital image, producing 2D image and/or 3D (media editing/programming).

#### **5.2.2 Production of Audio**

- Describe in details the steps of producing audio.
- Explain on concept of digital audio, compression of audio file, creating an audio and effects.

#### **5.2.3 Production of Video**

- Describe in details the steps of producing the video
- Explain the technique of producing the video, digitizing the video, effects and compression of video file.

### **5.2.4 Production of Animation**

- Describe in details the steps of producing an animation.
- For 3D, explain the process of modelling/sketching, mapping, animation, camera, lighting, texture, rendering process and editing.

### **5.3 Integration of Game Components**

- Describe in details the process of integrating the art components with the technical aspect of your game development.
- This may vary based on the game engine that you used.
- Elaborate the technical aspect of game programming.
- You may want to include snippet of source code that you would like to highlight for your game – E.g. source code that where you do integration with a specific device, source code of new mechanic that you worked on,
- Complete source code can be included in appendix.

### **5.4 Game Configuration Management**

Briefly describe how the game will be published as a viable product.

#### **5.4.1 Configuration Setup**

- Describe how your game will be published.
- Explain how to setup/install your game – this might include installation of special plug in, viewer, device and etc.

#### **5.4.2 Version Control Procedure**

- Describe the procedure and control in managing your game version.
- E.g.: Alpha, Beta, Release Candidate 1 (RC1)

### **5.5 Implementation Status**

Describe the progress of the development status for each of the component/module based on Gantt chart. E.g.: component/module name, description, duration to complete, date completed and status (delay, on time, in time or cancel).

## 5.6 Conclusion

Summarize the chapter and explain the next activities to be developed.

## CHAPTER 6. TESTING

### 6.1 Introduction

Briefly describe the activity involved in testing phase and what is the testing strategy to be adopted in your project.

### 6.2 Test Plan

Describe the component of a game test as below:

- **Purpose:** Technical, content, functional.
- **Phase:** Positioning in the development cycle.
- **Target groups:** Individual/ group of players including game developer, game tester.
- **Testing methods:** Proposed testing methods.
- **Game feature:** The element being tested.

### 6.3 Test Implementation

- Explanation in details how the testing and evaluation were conducted.
- This include elaboration on the procedure of testing methods (e.g.: focus group, playtesting, usability testing, bug hunting)
- Describe how test data were documented – questionnaires, playtest log and other relevant instruments.

### 6.4 Test Results and Analysis

- Analyze and discuss the test results.
- Results must be presented in a form of table/graph/chart and other relevant visual representation.

## **6.5 Conclusion**

Summarize the chapter and explain the next activities to be developed.

## **CHAPTER 7. CONCLUSION**

### **7.1 Observation of Strength and Weaknesses**

- State the strength and weaknesses of your project – this should focus on technical and development aspect of your project.
- Discuss the challenges and solutions to the problem that you encounter in developing the game – lesson learnt from the project.
- The weaknesses may also include limitations of your game/project.

### **7.2 Proposition for Improvement**

Elaborate suggestions for improvement of your game based on the limitations discussed in 7.1.

### **7.3 Contribution**

List and discuss the contributions of your project.

### **7.4 Conclusion**

State whether your project meets your set objectives conclusively.



## **REFERENCES**

- A list of references used in the project report such as journals, articles, books and etc. as directly quoted in the report.
- For complete reference, please refer to Final Year Project Writing Guide 2019.

## **BIBLIOGRAPHY**

- A list of references used in the project report such as journals, articles, books and etc. but not directly quoted in the report.
- For complete reference, please refer to Final Year Project Writing Guide 2019.

## **APPENDICES**

- E.g. user guide, user manual, diagrams and etc.

## ***BITI : ARTIFICIAL INTELLIGENCE***

### PROJECT TYPE I: ANALYSIS

*Note:*

- 1. Please refer to Computer Networking/Computer Security Project Type II: Analysis(Simulation and Testbed) above then associate it with your project domain.*
- 2. Any changes can still be made depending on the supervisor's consent.*

ARTIFICIAL INTELLIGENCE  
(BITI)

PROJECT TYPE II: PRODUCT

*Note: Any changes can still be made depending on the supervisor's consent.*

## CHAPTER 1. INTRODUCTION

### 1.1 Introduction

Introduction to your project and your project background as a whole but in brief.

### 1.2 Problem statement(s)

- Description of problems that directly influence the motives of the project. (Example, explanation of problems of XYZ & Co. record keeping)
- Applicable for project of improving or solving a specific case.
- Project that is of new creation, re-creation, individual initiative or not specifically involves any case to deal with, the problems can be included in the preamble paragraphs.

### 1.3 Objective

- Can be in point form format (use bullets) together with a brief explanation.
- Describe in sequence the objectives to be achieved. E.g. *To propose...*, *To design...*, *To implement...*, *to Evaluate...*, etc.

### 1.4 Scope

Describes every scope involved in your project and give reason(s) for the in- involvement. Examples: (e.g. children education), specific users (e.g. children between 5 and 8), other specific entities, specific platform (e.g. network, OS) etc.- Can be in point form format (use bullets) together with a brief explanation.

### **1.5 Project Significance**

Describes who/what may benefit from the project and how? You can infer it back to your objectives (if applicable).

### **1.6 Expected Output**

Describe what you expect from your project, the outcome of your research work or findings and the contribution to the knowledge as a whole.

### **1.7 Conclusion**

Give a summary of this chapter and next activities to be developed.

## **CHAPTER 2. LITERATURE REVIEW AND PROJECT METHODOLOGY**

### **2.1 Introduction**

Preview to the literature review and project methodology.

### **2.2 Facts and findings (based on topic)**

#### **2.2.1 Domain**

Identify domain related with your project with explanations.

#### **2.2.2 Existing System**

- Identify domain related with your project with explanations.
- Discuss and state your approach and related or past research, references, case study and other finding that relate to your project title. Examples: readings 1 and 3, experiments you get 3 and 4, case study 5 and 6 etc.
- Tagged the source if you refer the approach from published materials.
- Support the approach with statements (from published materials) to justify you fact findings are sound.
- Identify hardware and software used

#### **2.2.3 Technique**

- State other approaches than what you use that you think also applicable and related and give reason to justify why not.
- For fundamental or analysis project, this can be separated in a different chapter if necessary.

## **2.3 Project Methodology**

- Describe the selected approach or methodology used in your project (Examples: SSADM/SDLC/OOAD, Experimental Paradigm and Methods, and relevant methodology)
- Describe the activities that you may do in every stage and relate with your project. Egg. data collection, data pre-processing, etc.
- Describe the experiment measurements and parameters involved.
- For fundamental or analysis project, this can be separated in a different chapter if necessary.
- Include statements (from published materials) that support the approach you apply.

## **2.4 Project Requirements**

Include this section only if applicable. This section may not be necessary especially in fundamental and analysis project.

### **2.4.1 Software Requirement**

List software requirements in point form. Examples: MS Visual Basic Professional v.6.x, Apache Tomcat and the related for developing application software, MS Project 2000 for project management etc.

### **2.4.2 Hardware Requirement**

List hardware requirements in point form. Examples: PCs, server, devices and storage.

### **2.4.3 Other Requirements**

State other requirements to be used in your project such as you need special lab for project development, photo copy facility, discussion room and etc.

## **2.5 Project Schedule and Milestones**

- Explain your actions plan prior to the end of the project. Apply from what you have learnt from project management.
- List and describe stage by stage of your activities.
- Attach your project time line or Gantt chart (in 1 page view)

## **2.6 Conclusion**

Summarize the chapter and explain the next activities to be developed.



## **CHAPTER 3. ANALYSIS**

### **3.1 Introduction**

Preview to the analysis phase and how it would be developed.

### **3.2 Problem Analysis**

- Investigate and describe current system scenario/situation. Design the state diagram or data flow diagram or activity diagram from your reference(s), showing how the current system(s) or business(s) runs.
- Use statistics or mathematical formulation and validate the models (if using computational analysis).
- Use appropriate diagram to visualize the system flow such as hierarchy diagram or sequence diagram (if use OOAD with UML), DFD (if use SSADM) and Flowchart (for network project). For simulation based project, analyse the real graph given by industries.
- Explain in detail the problems statement as mentioned in Chapter 1.

### **3.3 Requirement analysis**

#### **3.3.1 Data Requirement**

- What kind of input and interface should be in the system.
- What kind of data to store in the database.
- It can be illustrated by using Data Model or Data Dictionary.

#### **3.3.2 Functional Requirement**

- Specify the functions of the system or algorithm.
- Explain on how it works, records, compute, transforms, and transmits within their frames.

- It can be illustrated by using state diagram, DFD, Context diagram or Use case.

### **3.3.3 Non-functional Requirement**

Specify how well the system performs its intended functions. E.g. Quality requirement, Performance-how many computer resources should it use, how accurate should the result be, how much data should it be able to store?

### **3.3.4 Others Requirement**

Describe each of software, hardware and requirements that will be used (justification of usage).

## **3.4 Conclusion**

Summarize the chapter and explain the next activities to be developed.

## **CHAPTER 4. DESIGN/THE PROPOSED TECHNIQUE**

*Note: The following sub-sections are guidelines, select and include only those related and necessary sections based on project type in your report.*

### **4.1 Introduction**

Introductory preview to this chapter. Examples: this chapter defines the results of the analysis of the preliminary design and the result of the detailed design.

### **4.2 High-Level Design**

**(For Fundamental and Analysis Project)**

Describe the proposed framework / approach / technique / method, etc.

OR

**(For Application Development Project)**

Describe high-level view of your system's structure or system's interior. You may refine some of the function below once you are in PSM II.

#### **4.2.1 System Architecture for expert system/DSS/simulation**

- Define architecture view of your system. The architecture view can be present in layer, framework, and tier or patent (for OOAD).
- Describe the static view and dynamic view of your application (for OOAD –use interaction diagram, high-level class diagram).
- For those use SSADM: use any appropriate diagram to view your system.

- Include appropriate diagram to explain artificial intelligence techniques in system development.

**OR**

#### **System Architecture for robotic and automation**

- Define architecture view of hardware. The architecture view can be present by layer or framework.
- Describe the static view or dynamic view of the application (use diagram such as state or sequence diagram).

### **4.2.2 User Interface Design for expert system/DSS/simulation**

Refine your user interface design that defined in chapter 5 of PSM I.

*OR*

#### **System Architecture for robotic and automation**

Refine on software and hardware that defined in chapter 5 of PSM I.

#### **4.2.2.1 Navigation Design**

Define and refine the navigation flow and types of navigation controls.

#### **4.2.2.2 Input Design for expert system/DSS/simulation**

- Define and refine the screens (e.g. types of inputs such as text, numbers, selection box etc.) used to enter information, as well as any forms on which users write or type information.
- Define and refine validation rule for each of input field.

*OR*

#### **Input Design for robotic and automation**

- Define and refine the control panels (e.g. types of inputs such as text, numbers, and selection box etc.) used to enter command to control robots assembly system.
- Define and refine validation rule for each of input field.

#### **4.2.2.3 Technical Design**

Define and refine selected AI techniques or pseudo-code or algorithms such as Fuzzy logic, Genetic algorithm, Artificial Neural Networks, Agent etc.

#### **4.2.2.4 Output Design**

Define and refine the types of outputs including detail reports, summary reports, turnaround documents and graphs. Classify your output in term of periodically or ad-hoc basis. For example daily, monthly, yearly etc.

### **4.2.3 Database Design**

#### **4.2.3.1 Conceptual and Logical Database Design**

- Introduce briefly to the logical data model (LDM) or entity relationship- ship diagram (ERD) and what they have to do with the database design.
- Define, refine and construct the entity relationship (ER) diagrams in details with explanation in text on what basis (business rules) applied for every entity relationship that have been defined in the diagram.
- Data dictionary and normalization

OR

#### **Non-database Design**

- Logical and conceptual design.
- Define, refine and provide explanation in text on what basis (business rules) applied for every elements in the diagram.

### **4.3 Detailed Design**

- Describe the proposed algorithm, etc.
- Specification and diagrams may be further elaborated. Emphasis should be on the logic of the design and the approach to satisfy the requirements
- Student should be able to answer on how will the system function

#### **4.3.1 Software or Hardware Design**

- For those use SSADM/SDLC: Describe in detail of every functions according to your DFD in format of program specification. The pro- gram specification includes

information of program description, file input/output, pseudo code and attach sample screens.

- For those use OOAD/UML: Describe in detail of every classes. Examples: class name, responsibility, attributes methods/operations. Describe every methods/operations such as its responsibility, input/output parameter, pre/post condition and algorithm –should be bias to language chosen for your software development (e.g. in English like of Java code)
- For those develop hardware: Describe in detail of every robot assembly system. The program specification includes information such as pseudo-code, ladder diagram of robot manipulators

#### **4.3.2 Physical Database Design**

For those develop database: Translate logical to target DBMS (use DDL/DCL) - base tables, design for other business rules (constraint- validation for fields, records), file organization and indexes.

OR

#### **Non-database Design**

Translate logical to robot controller and validate the model.

#### **4.4 Conclusion**

Summarize the chapter and explain the next activities to be developed

## **CHAPTER 5. IMPLEMENTATION**

### **5.1 Introduction**

- Introductory preview to this chapter.
- Briefly describe the activity involved in the implementation phase and what is the expected output after you complete this phase. Provide chapter outline diagram of Chapter 5.

### **5.2 Software Development Environment setup**

- Define your development environment setup.
- Use diagram to view/present the environment architecture. Examples: deployment diagram, draw the software (client s/w, server s/w), hardware (server configuration e.g. port no., IP address, database instance name, table space etc.) and network setup.

### **5.3 Software Configuration Management**

#### **5.3.1 Configuration environment setup**

- Explain how you design and setup the configuration management in your project. Do not explain on how to install the software.
- Explain (if any) the software tools used to support your configuration control. E.g. Visual SourceSafe, CVS etc.

#### **5.3.2 Version Control Procedure**

Describe the procedure and control in managing your source code version.

## **5.4 Implementation Status**

Describe the progress of the development status for each of the component/module. For example: component/module name, description, duration to complete, date completed, size of software etc.

## **5.5 Conclusion**

Summarize the chapter and explain the next activities to be developed.



## **CHAPTER 6. TESTING**

### **6.1 Introduction**

- Introductory preview to this chapter.
- For application development project, briefly describe the activity involved in testing phase and what is the testing strategy to be adopted in your project.
- For fundamental and analysis project, describe the experiments conducted and the testing procedures.

### **6.2 Test Plan**

Compulsory for application development project or if necessary.

#### **6.2.1 Test Organization**

Describe personnel involved.

#### **6.2.2 Test Environment**

- Describe the location/environment of testing to be carried out.
- Define hardware and firmware configurations and preparations and training prior to testing.
- Proof the formulas and methods using mathematical proving or statistical significant test.

#### **6.2.3 Test Schedule**

Define how many cycles and duration of your test to be conducted.

### **6.3 Test Strategy**

- Compulsory for application development project or if necessary.
- Explain the strategy to be selected such as bottom-up or top-down and black-box/white-box classes of tests.

#### **6.3.1 Classes of tests**

Output correctness or functionality test, Security test, Stress test and etc.

### **6.4 Test Implementation**

#### **6.4.1 Experimental / Test Description**

- In application development project, test case identification, test cases and expected result for each module are designed and documented.
- For fundamental and analysis project, describe in detailed the experimental settings and procedures.

#### **6.4.2 Test Data**

- Describe data collection process, type and characteristics of the experimental dataset, etc.
- Real data, synthetic data, experimental data or secondary data should be selected

### **6.5 Test Results and Analysis**

**For application development project**

- Test case identification, tester identification, result: OK/failed, and if failed, detailed description of the results/problems will be documented.
- How satisfied overall your intended users and yourself with the system. You may support your statement with scale 1-5 (the system is worst or great).

**For fundamental and analysis project**

- Present the experimental results in suitable format (graph, pie chart, table, etc.) and describe the results.
- Analyse the results and relate them to your objectives and verify with the literature reviews.

## **6.6 Conclusion**

Summarize the chapter and explain the next activities to be developed.

## **CHAPTER 7. CONCLUSION**

### **7.1 Observation on Weaknesses and Strengths**

- State the weaknesses and strength of your project.
- You also may state other's responses regarding project topics.

### **7.2 Propositions for Improvement**

- Present your suggestions on how your system can be improved better.
- Elaborate each of your suggestions in paragraph.

### **7.3 Project Contribution**

- State your project contribution to the university/faculty/company/individual.
- State where to find the user manual - e.g. Appendix XX

### **7.4 Conclusion**

- State whether you think your project meets your set objectives conclusively.
- Concluding phrases to conclude the project.

## **REFERENCES**

- A list of references used in the project report such as journals, articles, books and etc. as directly quoted in the report.
- For complete reference, please refer to Final Year Project Writing Guide 2019.

## **BIBLIOGRAPHY**

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- For complete reference, please refer to Final Year Project Writing Guide 2019.

## **APPENDICES**

- E.g. user guide, user manual, diagrams and etc.

***BITM : MEDIA INTERACTIVE***

## CHAPTER 1. INTRODUCTION

### 1.1 Introduction

To introduce your project in general which contains background of selected area (e.g. education, website, animation, broadcasting, etc.), current scenario, and the problem that might arise from current situation.

### 1.2 Problem statement(s)

- Detailed description of problems that you have identified from the previous current scenario. (Example: the current available courseware in Malaysia does not support the usage by colour blind users)
- Problem statement can be disregard if a project is a new creation, enhancement, individual initiative or not specifically involves any case to deal with. The problems must be included in the *Section 1.1 Project Background*.

### 1.3 Objective

- Objectives are set of goals that are achievable and measurable at the end of the project.
- Example:
  - To develop a courseware that can cater for colour blind user.
  - To apply constructivism learning theory in the courseware.
- The objective can be in point form format (use bullets) together with a brief explanation.

### 1.4 Scope

- Scopes explain the range of your project

- Describes every scope involved in your project in term of target user (e.g. One group colour blind only), contents or modules to be developed and deliverable (standalone, CD, web) and give reason(s) for the limitation.

### **1.5 Project Significance**

- Describes who will benefits from the project.
- What are the contributions when the project is successfully developed?
- You can refer and relate it back to your objectives.

### **1.6 Conclusion**

- Describes what you expect from your project.
- Give a summary of this chapter and next activities to be developed.



## CHAPTER 2. LITERATURE REVIEW AND PROJECT METHODOLOGY

### 2.1 Introduction

Preview to the literature review.

### 2.2 Domain

- Identify domain related with your project with explanations.
- Example: you have to explain on education for user with visual disability.

### 2.3 Existing System

- Discuss past research, references, case study and other finding that relate to your project title.
  - *Example 1: According to Hudaya (2006), the visual disability . . .*
  - *Example 2: Visual disability can be described as . . . (Hudaya, 2006)*
- Tagged the source if you refer the approach from published materials.
- Support the approach with statements (from published materials) to justify your fact findings are sound.
- Explain any others available existing system from similar domain.
- Identify hardware and software used by the existing system (if applicable)
- State other technique than what you use that you think also applicable and related and give reason to justify why not (if applicable)

#### 2.3.1 Comparison of Existing System

- Evaluate and compare the existing system in details.

- State the reasons for selected approaches. Support the approach with statements (from published materials) to justify your fact findings are sound.

## **2.4 Project Methodology**

- Describe the selected approach or methodology used in your project (Examples: SSADM/SDLC/, Instructional design model/Multimedia Production Process/Multimedia Development Life Cycle (MDLC) or own model based on generic process.
- Describe the activities that you may do in every stage and relate with your project. Include statements (from published materials) that support the approach you apply.

### **2.4.1 Instructional Design (Learning Applications Only)**

- Educational Goals  
Clearly define the learning objectives of the course. What will the students be able to accomplish after completion? Keep your goals practical and measurable so that students can evaluate their performance.
- Course Map/Flowchart  
Prepare a course map or flowchart showing how the course progresses from start to finish. You may include main menu, lessons, quizzes, help, options etc. The course material should be organized in a way that makes navigation on a small screen easy, simple and consistent.
- Detailed Course Content  
Chunk the content (cut it down to the essential and present it in discrete informational unit) for each element in the flowchart / course map prepared earlier. Present the content in small easy to digest modules
- Test Questions
  - Design your test questions keeping the course objectives in mind.
  - Decide where and how many test questions you need to prepare for each objective. Prepare the test questions, possible answer choices, correct answer + reinforcement (feedback), and wrong answer + remedial feedback.
- Metaphor  
Choose a look and feel or theme for the entire course. This includes colours, background graphics, and names of key elements.

## **2.5 Project Requirements**

### **2.5.1 Software Requirement**

List software requirement in point form. Examples : Adobe Dreamweaver, Adobe Flash, Adobe After Effect, Adobe Premiere, Adobe Audition, 3D Studio Max and the related for developing the end product.

### **2.5.2 Hardware Requirement**

List hardware requirement in point form. Examples: Graphic Tablet, touch screen and the related for developing the end product.

## **2.6 Conclusion**

Summarize the chapter and explain the next activities to be developed.

## CHAPTER 3. ANALYSIS

### 3.1 Current Scenario Analysis

- Current scenario analysis contains the generic flow of existing scenario representation.
- For non-existing application represent the analysis in the form of flow chart
- For existing system:
  - Linear application: storyline
  - Non-linear application: flow chart or navigation flow

### 3.2 Requirement analysis

#### 3.2.1 Project Requirement - Analysis of system to be developed

##### *Augmented/ Virtual Reality*

- Requirement Gathering
  - The project functionality to be produce.
  - Identify the proposed interaction that will be providing in the virtual reality environment.
  - Analyse the raw data/source for the design and development.
  - Explain the specific technique used in the PSM Project
- Explain the specific technique used in the PSM Project

##### *2D and 3D Animation*

- Requirement Gathering
  - The project specification to be produce. (Duration, frame rate etc.)
  - Identify the proposed storyline that will be developed.

- Analyse the raw data/source for the design and development (e.g. analyse the sample of scene (architecture, background scene, suitable texture with the concept of project) and character details (e.g. for human: type of eyes, type of nose, legs, hands etc.). The character detail should show the emotion of the character to be developed
- The need assessment should fulfil the requirement analysis
- Explain the specific technique used in the PSM Project

### *Broadcasting*

- Identify the Plan (a written document that summarizes the storyline (plot) of the project.
- Classify and discuss the Genre of the video or animation
- Type of script and Background Music selection
- Characters and Talent
- Discuss any special equipment's / techniques applied in the current video or animation

### *Mobile Application*

- Need Analysis
  - Specify why you are developing the mobile course. List the functional requirements that the course must fulfil.
- User Analysis
  - An analysis of user needs must be done in order to structure the mobile course to meet those needs.
- Technical Analysis
  - Define the toolbox of technologies. The purpose is to establish baseline technical capabilities and estimate development cost, effort and implications.
- Resource / Asset Analysis
- Requirement Gathering
  - Gather Requirement (interview, questionnaire, prototyping)
  - Analyse Requirement
  - Document Requirement (e.g. conceptual diagram, process specification)

### *E-learning –LMS (portal) & Interactive Web*

- Need Analysis
  - Specify why you are developing E-learning/ Interactive Web. List the functional requirements that the course must fulfil. .

- User Analysis
  - An analysis of user needs must be done in order to structure the project to meet those needs.
- Content Analysis
  - Analyse content for the project.
- Technical Analysis
  - Define the toolbox of technologies. The purpose is to establish baseline technical capabilities and estimate development cost, effort and implications. E.g.
    1. Define the minimum standards to develop the project.
    2. Define the constraints of the web
- Resource Analysis
  - Analyse the available resources. E.g. content, graphics, media, books, etc.
- Requirement Gathering
  - Gather Requirement (interview, questionnaire, prototyping)
  - Analyse Requirement
  - Document Requirement (e.g. conceptual diagram, process specification)

### *Games*

- Requirement Gathering
  - Specific the genre of the games wants to be developed.
  - Identify the proposed storyline that will be developed.
  - Analyse the existing games as you refer (e.g. analyse the weakness of the games, architecture, background scene, suitable texture with the concept of project) and character details
  - Show the flow of the existing games compare with the idea of the games should you want to develop.
  - The need assessment should fulfil the requirement analysis.
- Technical Analysis
  - Define the device of technologies as will use in this project (e.g.. Joystick, steering, controller, etc.). The purpose is to establish baseline technical capabilities and estimate development cost, effort and implications.

### *Learning Content*

- Need Analysis

- Specify why you are developing the courseware/teachware. List the functional requirements that the courseware must fulfil. (e.g. The current technique isn't helpful for the colour blind group . . . ),
- User Analysis
  - An analysis of user needs must be done in order to structure the courseware to meet those needs. (e.g. The colour blind group only understand limited colours such as. . . ),
- Technical Analysis
  - Define the toolbox of technologies. The purpose is to establish baseline technical capabilities and estimate development cost, effort and implications. (e.g. analyse the sample number of buttons placed in every pages. . . )
- Resource Analysis
  - Identify the learning materials, syllabus etc.
- Requirement Gathering
  - Gather Requirement (interview, questionnaire, prototyping)
  - Analyse Requirement
  - Document Requirement (e.g. conceptual diagram, process specification)

### **3.2.2 Software Requirement**

- Specify all the software requirements used in the project. Examples: Adobe Flash CS3, Apache Tomcat and the related for developing interactive application system, MS Project 2007 for project management etc.
- Summarize the used of the software according to the need of your project.

### **3.2.3 Hardware Requirement**

- Specify all the hardware requirements used in the project. Examples: PCs, server, devices and storage.
- Summarize the used of the hardware according to the need of your project.

### **3.2.4 Others Requirement**

- Specify other requirements to be used in your project such as you need special lab for project development, photo copy facility, discussion room and etc.
- Summarize the used of the other according to the need of your project.

### **3.3 Project Schedule and Milestones**

- Explain your actions plan prior to the end of the project. Apply from what you have learnt from project management.
- List and describe stage by stage of your activities.
- Attach your project time line or Gantt chart (in 1 page view)

### **3.4 Conclusion**

Summarize the chapter and explain the next activities to be developed.



## **CHAPTER 4. DESIGN**

### **4.1 Introduction**

Introductory preview to this chapter. Examples: this chapter defines the results of the analysis of the preliminary design and the result of the detailed design.

### **4.2 System Architecture (except video/animation)**

- Describes the overall system in “the big picture”. Provide suitable diagram for the architecture.

OR

#### **Scene Sequence Diagram (Video / Animation)**

- Scene Sequence Diagram. These sequences of scenes should be described in details and a sequence diagram to show the linear sequence against time to visualize the scenes arrangement..

### **4.3 Preliminary Design**

#### **4.3.1 Storyboard Design**

- Draw diagrams of multimedia features and affects, navigational and core contents. For animation or video required cinematography, type of shot, plan, script, running sheet and shot list.
- Character Profile (Animation)
  - Description of the character (e.g. age, gender, physical attribute, etc.)
  - Please provide the details of each character (sketch) –side view, front view and back view.

OR

#### **Pre-Production Documentation (Media Broadcasting)**

- Storyboard
  - Produce a storyboard which contains a rough sketch representation of the video including Scene numbering, type of shots and script reference.
- Shot List
  - Produce shot list which identify all the camera angles for a shoot, including coverage and cutaways. Format may vary as long as it is reflected in your storyboard.
  - Shot list is the order in which you plan to shot your video during the production stage.
- Running Sheet
  - Running sheet contains of information such as equipment checklist, scheduling on the production day, cast list and props list.
- Script
  - Script is a blueprint for a video production which identifies the sequence of images and audio (dialogue, sound, music) will appear. If you are creating a non-fiction video then the script will be quite different from the narrative video. Remember to get a permission for the image and sound produced or recorded by some else

OR

#### **Interactive Storyboard (Augmented/Virtual Reality)**

Same as learning storyboard.

### **4.4 User Interface Design (except video/animation)**

(a). Navigation Design:

- Define web structure used in the project
- Create site map for the project
- Define and refine the navigation flow and types of navigation control

(b). Input Design:

- Define and refine the screens (e.g. types of inputs such as text, numbers, and selection box etc.) used to enter information, as well as any forms on which users write or type information.
- Define and refine validation rule for each of input field.
- Refer to what you've learnt from multimedia major courses

(c). Output Design:

Define and refine the types of outputs including detail reports, summary reports, turnaround documents and graphs. Classify your output in term of periodically or ad-hoc basis. For example daily, monthly, yearly etc.

(d). Database Design:

Introduce briefly to the logical data model (LDM) or entity relation- ship diagram (ERD) and what they have to do with your database design.

(e). Metaphors:

Define a look and feel or theme of the user interface element and interaction design based on the representations of culture, demography and platform.

(f). Template Design:

- Design and create template for the project vii. Media creation and integration:
- Design and create the variety of contents that will make up the project based on the storyboard.
- Integrate all the contents and the contents must be added to the HTML pages generated with the template design. Explain the integration process.

(g). Uploading Files:

Explain the process of uploading the documents to the remote hosting server.

## 4.5 Conclusion

Summarize the chapter and explain the next activities to be developed

## CHAPTER 5. IMPLEMENTATION

### 5.1 Introduction

Briefly describe the activity involved in the implementation phase and what is the expected output after you complete this phase.

### 5.2 Media Creation

#### (a). Production of Texts

Describe types of texts, fonts handling and texts formats.

#### (b). Production of Graphics

Explain either uses the bitmap or vector, extracting digital image, producing 2D image and/or 3D (media editing/programming)

#### (c). Production of Audio

Explain on concept of digital audio, compression of audio file, creating an audio and effects.

#### (d). Production of Video

Explain the technique of producing the video, digitizing the video, effects and compression of video file.

#### (e). Production of Animation

- Process of modelling/sketching, mapping, animation, camera, lighting and texture.
- Rendering process and editing.
- Use diagram to view/present the environment architecture. Examples: deployment diagram, draw the software (client software, server software), hardware (server configuration e.g. port no., IP address, database instance name, table space etc.) and network setup.

### 5.3 Media Integration

Explain the process of integrating the created multimedia component/element.

### 5.4 Product Configuration Management

- Configuration Environment Setup
  - Explain how you design and setup the configuration management in your project.
  - Explain the plug-in, codec, player or viewer required in your project.
  - Process of product implementation (e.g. uploading content to mobile phone, process of DVD setup)
- Version Control Procedure
  - Describe the procedure and control in managing your version. E.g. Alpha, Beta, Release Candidate 1 (RC1), Release Candidate 2 (RC2) and Golden Master Release.

### 5.5 Implementation Status

Describe the progress of the development status for each of the component/module based on Gantt chart. For example: component/module name, description, duration to complete, date completed and status (de- lay, on time, in time or cancel).

### 5.6 Conclusion

Summarize the chapter and explain the next activities to be developed.

## **CHAPTER 6. TESTING**

### **6.1 Introduction**

Introductory preview to this chapter. E.g. briefly describe the activity involved in testing phase and what is the testing strategy to be adopted in your project. Provide chapter outline diagram of Chapter 6.

### **6.2 Test Plan**

#### **6.2.1 Test User**

Describe personnel involved.

#### **6.2.2 Test Environment**

- Describe the location/environment of testing to be carried out.
- Define hardware, firmware configurations, preparations and training prior to testing.

#### **6.2.3 Test Schedule**

Define how many cycles and duration of your test to be conducted.

### **6.3 Test Strategy**

Interactive Web (Explain the strategy to be selected such as bottom-up or top-down and black-box/white-box classes of tests).

OR

Animation and Video (Alpha, beta and acceptance testing).

## **6.4 Test Implementation**

### **6.4.1 Test Description**

Test case identification, test cases and expected result for each module are designed and documented.

### **6.4.2 Test Data**

Real life or synthetic data will be selected.

## **6.5 Test Results and Analysis**

- Test case identification, tester identification, test case results (Success/Fail), and detailed documentation on the failed test case.
- How satisfied overall your intended users and yourself with the system.

## **6.6 Analysis Testing**

Includes figure and graph/chart.

## **6.7 Conclusion**

Summarize the chapter and explain the next activities to be developed.

## **CHAPTER 7. CONCLUSION**

### **7.1 Observation on Weaknesses and Strengths**

- State the weaknesses and strength of your project.
- You also may state other's responses regarding project topics.

### **7.2 Propositions for Improvement**

- Present your suggestions on how your system can be improved better.
- Elaborate each of your suggestions in paragraph.

### **7.3 Project Contribution**

- State your project contribution to the university/faculty/company/individual.
- State where to find the user manual - e.g. Appendix XX

### **7.4 Conclusion**

- State whether you think your project meets your set objectives conclusively.
- Concluding phrases to conclude the project.



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- For complete reference, please refer to Final Year Project Writing Guide 2019.

## **APPENDICES**

- E.g. user guide, user manual, diagrams and etc.

## ***BITS : SOFTWARE DEVELOPMENT***

## **CHAPTER 1. INTRODUCTION**

### **1.1 Introduction**

Introduction to your project and your project background as a whole but in brief.

### **1.2 Problem statement(s)**

- Description of problems that directly influence the motives of the project. (Example, explanation of problems of XYZ & Co. record keeping)
- Applicable for project of improving or solving a specific case.
- Project that is of new creation, re-creation, individual initiative or not specifically involves any case to deal with, the problems can be included in the preamble paragraphs.

### **1.3 Objective**

Can be in point form format (use bullets) together with a brief explanation.

### **1.4 Scope**

- Describes every scope involved in your project and give reason(s) for the involvement. Examples: (e.g. children education), specific users (e.g. children between 5 and 8), other specific entities, specific platform (e.g. network, OS) etc.
- Can be in point form format (use bullets) together with a brief explanation.

### **1.5 Project Significance**

Describes who/what may benefits from the project and how? You can infer it back to your objectives (if applicable).

## **1.6 Expected Output**

Describes what do you expected from your project.

## **1.7 Conclusion**

Give a summary of this chapter and next activities to be developed.

## **CHAPTER 2. LITERATURE REVIEW AND PROJECT METHODOLOGY**

### **2.1 Introduction**

Preview to the literature review and project methodology.

### **2.2 Facts and findings (based on topic)**

#### **2.2.1 Domain**

Identify domain related with your project with explanations.

#### **2.2.2 Existing System**

- Identify domain related with your project with explanations.
- Discuss and state your approach and related or past research, references, case study and other finding that relate to your project title. Examples: readings 1 and 3, experiments you get 3 and 4, case study 5 and 6 etc.
- Tagged the source if you refer the approach from published materials.
- Support the approach with statements (from published materials) to justify you fact findings are sound.
- Identify hardware and software used

#### **2.2.3 Technique**

- State other approaches than what you use that you think also applicable and related and give reason to justify why not.

## **2.3 Project Methodology**

- Describe the selected approach or methodology used in your project (Examples: SSADM/SDLC/OOAD, Instructional design, Database life cycle and relevant methodology)
- Describe the activities that you may do in every stage and relate with your project.
- Include statements (from published materials) that support the approach you apply.

## **2.4 Project Requirements**

### **2.4.1 Software Requirement**

- List software requirements in point form. Examples: MS Visual Basic Professional v.6.x, Apache Tomcat and the related for developing application software, MS Project 2000 for project management etc.

### **2.4.2 Hardware Requirement**

- List hardware requirements in point form. Examples: PCs, server, devices and storage.

### **2.4.3 Other Requirements**

- State other requirements to be used in your project such as you need special lab for project development, photo copy facility, discussion room and etc.

## **2.5 Project Schedule and Milestones**

- Explain your actions plan prior to the end of the project. Apply from what you have learnt from project management.
- List and describe stage by stage of your activities.
- Attach your project time line or Gantt chart (in 1 page view)

## **2.6 Conclusion**

Summarize the chapter and explain the next activities to be developed.

## **CHAPTER 3. ANALYSIS**

### **3.1 Introduction**

Preview to the analysis phase and how it would be developed.

### **3.2 Problem Analysis**

- Investigate and describe current system scenario/situation. Reiterate the data flow diagram or activity diagram from your reference(s), showing how the current system(s) or business(s) runs.
- Use appropriate diagram to visualize the system flow such as sequence diagram (if use OOAD with UML), DFD (if use SSADM) and Flowchart (for network project).
- For simulation based project, analyse the real graph given by company.
- Explain in detail the problems statement as mentioned in Chapter 1.

### **3.3 Requirement analysis**

#### **3.3.1 Data Requirement**

- What data should the system input and output, and what data should the system store internally.
- It can be illustrated by using Data Model or Data Dictionary.

#### **3.3.2 Functional Requirement**

- Specify the functions of the system, how it records, compute, trans- forms, and transmits data.
- It can be illustrated by using DFD, Context diagram or Use case.

### **3.3.3 Non-functional Requirement**

Specify how well the system performs its intended functions. E.g. Quality requirement, Performance-how many computer resources should it use, how accurate should the result be, how much data should it be able to store?

### **3.3.4 Others Requirement**

Describe each of software, hardware and requirements that will be used (justification of usage).

## **3.4 Conclusion**

Summarize the chapter and explain the next activities to be developed.



## **CHAPTER 4. DESIGN**

### **4.1 Introduction**

Introductory preview to this chapter. Examples: this chapter defines the results of the analysis of the preliminary design and the result of the detailed design.

### **4.2 High-Level Design**

Describe high-level view of your system's structure or system's interior. You may refine some of the function below once you are in PSM II.

#### **4.2.1 System Architecture**

- Define architecture view of your system. The architecture view can be presented in layer, framework, tier or patent (for OOAD).
- Describe the static view and dynamic view of your application (for OOAD - use interaction diagram, high-level class diagram).
- For those use SSADM: use any appropriate diagram to view your system.

#### **4.2.2 User Interface Design**

Refine your user interface design that defined in chapter 5 of PSM I.

##### **(a). Navigation Design**

Define and refine the navigation flow and types of navigation controls.

##### **(b). Input Design**

- Define and refine the screens (e.g. types of inputs such as text, numbers, and selection box etc.) used to enter information, as well as any forms on which users write or type information.
- Define and refine validation rule for each of input field.

(c). Output Design

Define and refine the types of outputs including detail reports, summary reports, turnaround documents and graphs. Classify your output in term of periodically or ad-hoc basis. For example daily, monthly, yearly etc.

### **4.2.3 Database Design**

#### **4.2.3.1 Conceptual and Logical Database Design**

- Introduce briefly to the logical data model (LDM) or entity relationship diagram (ERD) and what they have to do with your database design.
- Define, refine and construct the entity relationship (ER) diagrams in details with explanation in text on what basis (business rules) you apply for every entity relationship you have defined in the diagram.
- Data dictionary and normalization

### **4.3 Detailed Design**

Specification and diagrams may be further elaborated. Emphasis should be on the logic of the design and the approach to satisfying the requirements – How will the system function?

#### **4.3.1 Software Design**

- For those use SSADM/SDLC: Describe in detail of every functions according to your DFD in format of program specification. The program specification includes information of program description, file input/output, pseudo code and attach sample screens.
- For those use OOAD/UML: Describe in detail of every classes. Examples: class name, responsibility, attributes methods/operations. Describe every methods/operations such as its responsibility, input/output parameter, pre/post condition and algorithm –should be bias to language chosen for your software development (e.g. in English like of Java code).

#### **4.3.2 Physical Database Design**

Translate logical to target DBMS (use DDL/DCL) - base tables, design for other business rules (constraint- validation for fields, records), file organization and indexes

#### **4.4 Conclusion**

Summarize the chapter and explain the next activities to be developed

## **CHAPTER 5. IMPLEMENTATION**

### **5.1 Introduction**

- Introductory preview to this chapter.
- Briefly describe the activity involved in the implementation phase and what is the expected output after you complete this phase. Provide chapter outline diagram of Chapter 5.

### **5.2 Software Development Environment setup**

- Define your development environment setup.
- Use diagram to view/present the environment architecture. Examples: deployment diagram, draw the software (client s/w, server s/w), hardware (server configuration e.g. port no., IP address, database instance name, table space etc.) and network setup.

### **5.3 Software Configuration Management**

#### **5.3.1 Configuration environment setup**

- Explain how you design and setup the configuration management in your project. Do not explain on how to install the software.
- Explain (if any) the software tools used to support your configuration control. E.g. Visual SourceSafe, CVS etc.

#### **5.3.2 Version Control Procedure**

Describe the procedure and control in managing your source code version.

## **5.4 Implementation Status**

Describe the progress of the development status for each of the component/module. For example: component/module name, description, duration to complete, date completed, size of software etc.

## **5.5 Conclusion**

Summarize the chapter and explain the next activities to be developed.

## **CHAPTER 6. TESTING**

### **6.1 Introduction**

Introductory preview to this chapter. E.g. briefly describe the activity involved in testing phase and what is the testing strategy to be adopted in your project. Provide chapter outline diagram of Chapter 6.

### **6.2 Test Plan**

#### **6.2.1 Test Organization**

Describe personnel involved.

#### **6.2.2 Test Environment**

- Describe the location/environment of testing to be carried out.
- Define hardware, firmware configurations, preparations and training prior to testing.

#### **6.2.3 Test Schedule**

Define how many cycles and duration of your test to be conducted.

### **6.3 Test Strategy**

Explain the strategy to be selected such as bottom-up or top-down and black-box/white-box classes of tests.

#### **6.3.1 Classes of tests**

Output correctness or functionality test, Security test, Stress test and etc.

## **6.4 Test Design**

### **6.4.1 Test Description**

Test case identification, test cases and expected result for each module are designed and documented.

### **6.4.2 Test Data**

Real life or synthetic data will be selected.

## **6.5 Test Results and Analysis**

- Test case identification, tester identification, test case results (Success/Fail), and detailed documentation on the failed test case.
- How satisfied overall your intended users and yourself with the system.

## **6.6 Conclusion**

Summarize the chapter and explain the next activities to be developed.

## **CHAPTER 7. CONCLUSION**

### **7.1 Observation on Weaknesses and Strengths**

- State the weaknesses and strength of your project.
- You also may state other's responses regarding project topics.

### **7.2 Propositions for Improvement**

- Present your suggestions on how your system can be improved better.
- Elaborate each of your suggestions in paragraph.

### **7.3 Project Contribution**

- State your project contribution to the university/faculty/company/individual.
- State where to find the user manual - e.g. Appendix XX

### **7.4 Conclusion**

- State whether you think your project meets your set objectives conclusively.
- Concluding phrases to conclude the project.



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## **BIBLIOGRAPHY**

- A list of references used in the project report such as journals, articles, books and etc. but not directly quoted in the report.
- For complete reference, please refer to Final Year Project Writing Guide 2019.

## **APPENDICES**

- E.g. user guide, user manual, diagrams and etc.

## **PART III : LIST OF APPENDICES**

### **IMPORTANT NOTES:**

The following appendices are purposely for clearer understanding on how does your report look like.

Please kindly to download and use the provided template version from the course page in the e-Learning platform.