

**USMAN INSTITUTE OF TECHNOLOGY**

Affiliated with NED University of Engineering & Technology, Karachi

**Department of Computer Science**

B.S. Computer Science / Software Engineering

FINAL YEAR PROJECT REPORT

**Batch-2019**

**PROJECT NAME**

**By**

|  |  |
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Submission Performa

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Title of Report

Project Supervisor’s Name and Signature

This report is submitted as required for the Project in accordance with the rules laid down by the Usman Institute of technology as part of the requirements for the award of the degree of Bachelor Computer **Science/Software Engineering**. I declare that the work presented in this report is my own except where due reference or acknowledgement is given to the work of others.

Signatures of students Date

(1)…………………………….. ……………………..

(2)……………………………. …………………….

(3)…………………………….. …………………….

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(5) …………………………….. …………………….

Acknowledgments

This page should consist of the acknowledgements to the people, companies and institutions that have been helpful to the author in compiling the reports. It is normal practice to thank the Head of Institute for the use of facilities with which the project was carried out, the head of department, the supervisor for his/her suggestions and guidance and any other member of the academic and technical support staff who have made a significant contribution to the success of the project, and finally your family member (that is optional).

Abstract

The abstract is a brief summary of your research. Typically, an abstract should be one page and/or less than 350 words. Your abstract should consist of concise precise to inform the reader of the content of the report, what the project was about, the main aim of the project, how the work was undertaken and major conclusions drawn from the work performed. It is important not to confuse an abstract with introduction. The first sentence should give the subject of the report and the last sentence should state the primary conclusion of the report. The abstract should be written in the present tense. It should not include illustrative material such as formula, diagrams, and charts. The abstract page numbered ii. It should conclude with short entry ‘Keywords’, Nominating several keywords by which a computerized library would find the project.

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The table of the contents is on a separate page and is numbered iii. The table of contents lists the sections of the report, a list of figures and a list of tables along with the page on which they begin. It is to be generated by MS word -> references -> table of contents, similarly list of tables and list of figures.

List of tables

List of figures

List of symbols and Units

A list of symbols and units should be included to assist the reader. This should include any Greek letters or other mathematical symbols together with the quantities to which they refer, and their appropriate units. Preferred 2-3 pages of UML notations used in the project.

# Introduction

This should introduce the reader to the subject are described in the report, **what the project was about and why it was undertaken**. It should be written in a manner sufficient to allow a reader unfamiliar with the project to appreciate any background knowledge necessary to understand the report.

Describe the function, show the **block/system** diagram, and give the performance specifications as they appear in your final proposal. Show that you know what variables are important in your project’s performance, and what values they should take on. Describe briefly the subprojects into which the project has been divided. Introduce the structure of the report (brief summary about what you will cover in which chapter in separate paragraphs).

# Background and Literature Review

This Chapter should describe the current state of knowledge concerning the subject involved in the project. It should review literature on the subject and highlight the information relevant to the immediate activity undertaken in the project. The survey should cover a sufficient amount of available literature to highlight the gaps in current knowledge and to support and allow predictions to be made regarding main work covered in the project. Try to include related work (if you know). This chapter will cover information related to **similar applications** (their source, main features, deployment strategies, cost, one of the technical interface etc.), **algorithms** (their source, significance, implementation details), preferred from research papers, and books. Where literature sources are quoted, these should be in IEEE/ ACM citation format, also referring to the “Reference” Chapter of the report.

# Aim and Statement of Problem

The aim of the project should be clearly stated with sufficient explanation to make these easily understandable. Write succinct definition of the problem. Defines and limits the ‘Scope’ of the effort. Clearly describe how you tackled the problem. Preferred to explain each problem in separate subheading. It is preferred to mention problem regarding **different stakeholders, and technology** related issues. Provide enough information for knowledgeable person where difficulty or lack of time has caused a change in the aims of the project. The nature of any changes in aims and the reasons for these changes should be explicitly stated within this Chapter.

# Hardware, Software analysis and requirements

Explain which ***fact-finding techniques*** that you have used in your project. Explain which specialized hardware used in your project. Comparison of different available hardware solution and why your choice is more significant. Comparison of different choices for software technologies (front end, back end, middle layer, simulation), algorithms and data structures. Show overall system structure with the help of (system diagram, actor use case diagram, activity diagram, operational diagram). Also mention requirements in standard format of As a < type of user >, I want < some goal > so that < some reason >.

Resource:

*For user stories:* [*https://www.amazon.com/User-Stories-Applied-Software-Development/dp/0321205685*](https://www.amazon.com/User-Stories-Applied-Software-Development/dp/0321205685)

# Software design and modeling

In this chapter project architecture is presented (explain which architecture is used), overall design diagrams (complete object diagram, complete class diagram, database diagram, etc.) to be shown. (as such diagrams are usually huge in nature, it is appropriate to print in on A3 or bigger sheets, and then fold it to A4 size).use few behavioral diagrams (sequence diagram, timing diagram, activity diagram, state transition diagram, or composite diagram) only for core technical functionality of the project against use cases. Show application’s landing/main/home interface, also show high fidelity prototypes (input, output, inquiry, debugging, configuration, and wrapper) on (Image, Audio, video, text, tags, AR, VR) against specific use case.

Resources:

[**https://www.uml-diagrams.org/uml-25-diagrams.html**](https://www.uml-diagrams.org/uml-25-diagrams.html)

[**https://sysml.org/**](https://sysml.org/)

# Algorithm analysis and complexity

In this chapter you have to mention algorithms that are used in project. Its purpose and significance, along with its pseudocode. Compare your selected algorithm with such other algorithms. For each algorithm show its best, average, and worst values in context of time and space complexity. Show primary references of all mentioned algorithms.

# Implementation

Give code details (not a complete listing, but description of key parts). Discuss the most important/interesting aspects. It probably won’t be possible to discuss everything- give a rationale for what you do. Code shall not be more than 3-5 pages. Use appropriate code writing standards, draw operational diagram, component diagram and deployment diagram. Show only two to three technical interfaces that represents the core project functionality with explanation (You may use POC interfaces). Draw state transition diagram of project interface (input, output, and processes).

# Testing

This chapter contains White box of most logical code, and black box testing of that interfaces that represents core functionality of the project1 (onlyshow test cases and their results). Some of the system level structural and functional testing must be shown with the help of tools2. You have to show test plan – how the program/system was verified. Put the actual test results in the annexure.

This chapter also covers results of different types of experiments/simulations that were carried out with the code written. Why were certain experiments in the simulation used and how did they affect the results? If there are very many graphs and tables associated with this Chapter they may be placed in annexure.

***Resources:***

1. Pressman, Roger S. "Software Engineering: A practitioner’s approach." *9th Edition* (2020), Chapter 19-21
2. Perry, William E. *Effective Methods for Software Testing, CafeScribe: Includes Complete Guidelines, Checklists, and Templates*. John Wiley & Sons, 2007, Chapter 8

# Discussion (optional)

This Chapter should fully and logically discuss the progression of the project including the methods used and the results of experimentation, or the design; in such a way that examiner can evaluate the worth of the project. The discussion should be backed by detailed reference to material in the testing chapter of the report.

# Conclusions

This Chapter should be a concise statement of the conclusions which may be drawn from the work attempted. The reader needs to be convinced that the design will work. If Uncertainties remain, they should be pointed out, and alternatives, such as modifying performance specifications, should be spelled out to deal with foreseeable outcome.

# Future work

This Chapter may be used to propose further work which may be carried out on the project in subsequent study projects. Suggestions of this type should be limited to proposals which involve significant amounts of work such as major modifications of equipment or development of student practical experiments/enhancement. If any component is developed, how it can be utilized with proper documentation. Any suggestion is to be given in sufficient detail to provide adequate information for a future student to be able to fully appraise the proposal. which other similar project can be developed by using same concept with different domain/technology.

# Achievements

In this chapter you have to summarize your participations in different competitions, conferences, incubation activities, and exhibitions. It is desired to express your experience about such activities. Also mention what you achieved in such activities e.g experience, acknowledgement, certificates, souvenirs , and rewards. If it is in process show correspondence evidence.

# Appendices

These shall be used to give detailed results that shall be summarized in main text. The normal practice is “Annex A, B, C…” and, when required, “Appendix (to annex) 1, 2, 3…..” They should identify on every page by running header. Following items should be included in appendices

In **acknowledgement chapter**, you may include official letters from organizations.

In **introduction chapter** 2-3 pages about organization for which you are developing the project

In **background and literature review chapter**, research paper that is basis of your project, details of similar projects, any UML diagrams from other sources that has strong relationship with your project

In **hardware, software analysis and requirement,** you may add hardware pacification, use case narrations, or detailed requirement specification document.

In **software design and modeling chapter**, you may add detailed design documents other than most significant.

In **software algorithm and complexity**, you may attach actual algorithm or its research paper.

In **achievement chapter**, you have to mention correspondence (letters, emails etc.), copy of certificate, pictures of participation specially at time of award ceremony.

You may add any detail that is summarized in any chapters but need more focus and clarity for reader.

# General Guidelines

- Begin each chapter on new page.

- Each chapter should have small introduction at beginning of chapter. Introduction must link to previous chapter. It is a one or more then one paragraph but not more than one page that introduces the reader to the subject. The introduction presents basic background material, the history of the problem and contains the key sentence outlining the subjects to be discussed.

The total report length should be **100- 120 pages**; most projects somewhat shorter. There is no value in trying to artificially lengthen your project by ‘padding’ it. Each project is unique and has its own natural length, and you will probably know when you have said everything that you need to be said.

## Typing and size of paper

I. The report is to be typewritten on one side of the paper on international size A4 paper (297mmX210mm). This paper must be good quality bond (70-90 gsm).

ii. Reports length should be 100-120 pages.

iii. Use Times New Roman, size 12 font throughout the reports.

Use 1.5 or double spacing.

## Page number and Chapter number

- Use lower case Roman numerals for preliminary pages

I. Title page (not numbered on page)

ii. Abstract

Table of Contents

The text of the report begins with Arabic number 1. Number all pages. Page numbers can be inserted either at the bottom/top right or the bottom/top center.

All appendices should number as A-1, A-2, etc. for pages under appendix A, and B-1, B-2, etc. for pages under appendix B (See Table of Contents.).

A hierarchical numbering scheme for chapter numbering shall be used. For instance, use 1 for chapter one, 2 for chapter 2, 1.1 for the subsection 1 of chapter 1, etc. (See the Table of Contents).

## Margin boundaries

I. 1 -inch left margin.

ii. 0.5-inch margin on the other three sides.

## Diagrams and figures

Figures and table should be inserted in the text in one of the three places

A full page figure or illustration must be inserted on the left hand side facing the typescript which described it.

Small figure should be incorporated in the text with the legend appearing below (not recommended).

Each graph, figure, etc., should have a figure number and title typed below it. The type style should be same as the text. Figures should be numbered by chapters (Fig. 1.1, Fig 1.2, Fig. 2.1, etc). explain each figure by referring its number (e.g. in Fig 1.1), don’t assume any figure is self-explanatory. Whichever numbering system you use, make sure that you follow the same system for tables and equations, also explain then as figures.

Line drawings, graphs, and monograms should be in bold clear lines. Where graphs, diagrams and figures cannot be mounted vertically on the page these are to be mounted and labeled in such a way that they can be read from the right hand side(900 on the page) of the page .

All the axes of graphs are to be labeled with the parameter and its units. Information on illustrations and graphs such as labels, scales etc. must be typewritten.

## Photocopying

All the figures, etc. must be reproduced by an electronic or electrostatic or photographic method which is known not to fade.

## Fixing of photograph

Full page photographs should be bound into the report. Small photographs must be firmly fixed to the paper. An alternative is to use color photocopying or digital processing.

## Tables

Each table should be numbered consecutively (Table 1, Table 2) or by chapter (Table 1.1, Table 1.2, Table 2.1).Table number should be centre above the top of the table and be followed on the next line by a brief descriptive caption, preferably in cap. The type should be the same as the text. Refer to each table in text by number “In Table 1, one can clearly see………”The same rules for location of figures apply to tables.

TABLE 1. MEASURED RESISTOR VALUES AND THE METER ERROR

|  |  |  |
| --- | --- | --- |
| Nominal Value Marked | Measured Value | Error (%) |
|  |  |  |
|  |  |  |

## Equations

Centre each equation on separate line. Number equations consecutively in parentheses at the right margin. Equation may be referenced by number in the text, using parentheses around the number.

Y (t) = ∫sin (x) dx (1)

## Units

The S.I. system of units is to be used throughout. Where difficulties are introduced by quotation of imperial units from reference source, these should be accompanied by the appropriate conversion to S.I. units in parentheses.

## References

At the end of your work, list full details of all of the sources which you have cited in your text in a section headed *References*, in numeric order. References listed must follow IEEE formatting guidelines (see reference examples overleaf). Your reference list should allow anyone reading your work to identify and find the material to which you have referred.

In IEEE style your reference list should be formatted in the following way:

* Align references left
* Single-space each entry, double-space between every new entry
* Place number of entry at left margin, enclose in square brackets [ ] Indent text of entries

### Citations/references with multiple authors

If you choose to mention the author(s) of a source whilst citing it in the text of your work, if there are three or more you can abbreviate them using ‘et al.’ e.g. During their research, Fan, et al. [4] discuss lasers in detail. However, in general you do not need to mention the authors by name, just use the numeric citation in square brackets. In your full reference list at the end however, you always give the authors’ names. In the reference list you can only abbreviate these using ‘et al.’ if there are six or more authors.

### Reference examples

There are standard reference formats for most types of document. Below are examples of the most common types of document you might want to reference. Each of the following gives a suggested standard format for the reference followed by examples for the different document types.

### Book

[Ref number] Author’s initials. Author’s Surname, *Book Title*, edition (if not first). Place of publication: Publisher, Year.

[1] I.A. Glover and P.M. Grant, *Digital Communications*, 3rd ed. Harlow: Prentice Hall, 2009.

### Book chapter

[Ref number] Author’s initials. Author’s Surname, “Title of chapter in book,” in *Book Title,* edition (if not first), Editor’s initials. Editor’s Surname, Ed. Place of publication: Publisher, Year, page numbers.

[2] C. W. Li and G. J. Wang, "MEMS manufacturing techniques for tissue scaffolding devices," in *Mems for Biomedical Applications*, S. Bhansali and A. Vasudev, Eds. Cambridge: Woodhead, 2012, pp. 192-217.

### Electronic Book

[Ref number] Author’s initials. Author’s Surname. (Year, Month Day). *Book Title* (edition) [Type of medium]. Available: URL

[3] W. Zeng, H. Yu, C. Lin. (2013, Dec 19). *Multimedia Security Technologies for Digital Rights Management* [Online]. Available: http://goo.gl/xQ6doi

Note: If the e-book is a direct equivalent of a print book e.g. in PDF format, you can reference it as a normal print book.

### Journal article

[Ref number] Author’s initials. Author’s Surname, “Title of article,” *Title of journal abbreviated in Italics,* vol. number, issue number*,* page numbers, Abbreviated Month Year.

[4] F. Yan, Y. Gu, Y. Wang, C. M. Wang, X. Y. Hu, H. X. Peng, et al., "Study on the interaction mechanism between laser and rock during perforation," *Optics and Laser Technology,* vol. 54, pp. 303-308, Dec 2013.

Note: the above example article is from a journal which does not use issue numbers, so they are not included in the reference.

### E-Journal article

PDF versions of journal articles are direct copies of the print edition, so you can cite them as print journals.

[Ref number] Author’s initials. Author’s Surname. (Year, Month). “Title of article.” *Journal Title* [type of medium]. volume number, issue number, page numbers if given. Available: URL

[5] M. Semilof. (1996, July). “Driving commerce to the web-corporate intranets and the internet: lines blur”. *Communication Week* [Online]. vol. 6, issue 19. Available: http://www.techweb.com/se/directlinkcgi?CWK19960715S0005

**When you are compiling your reference list you may abbreviate journal titles:**

For a list of IEEE abbreviations go to:

<https://www.ieee.org/documents/trans_journal_names.pdf>

For non IEEE journal abbreviations go to:<http://www.bath.ac.uk/library/help/infoguides/abbreviations.html>

For further information on the common abbreviations of words used in references for the IEEE style go to:

<http://www.ieee.org/documents/style_manual.pdf>

### Conference papers

[Ref number] Author’s initials. Author’s Surname, “Title of paper,” in *Name of Conference,* Location, Year, pp. xxx.

[6] S. Adachi, T. Horio, T. Suzuki. "Intense vacuum-ultraviolet single-order harmonic pulse by a deep-ultraviolet driving laser," in *Conf.* *Lasers and Electro-Optics*, San Jose, CA, 2012, pp.2118-2120.

Standard abbreviations may be applied to the title of the conference. For a table of abbreviations go to: <http://www.ieee.org/documents/ieeecitationref.pdf>

### Reports

The general form for citing technical reports is to place the name and location of the company or institution after the author and title and to give the report number and date at the end of the reference. If the report has a volume number add it after the year.

[Ref number] Author’s initials. Author’s Surname, “Title of report,” Abbreviated Name of Company., City of Company., State, Report number, year.

[7] P. Diament and W. L. Luptakin, “V-line surface-wave radiation and scanning,” Dept. Elect. Eng., Colombia Univ., New York, Sci Rep. 85, 1991.

### Patents

[Ref number] Author’s initials. Author’s Surname, “Title of patent,” Country where patent is registered. Patent number, Abbrev of Month Day Year.

[8] J. P. Wilkinson, “Nonlinear resonant circuit devices,” U.S. Patent 3 624 125, July 16 1990.

Note: Use “issued date” if several dates are given.

### Standards

[Reference number] *Title of Standard*, Standard number, date.

[9] *Shunt power capacitors*, IEEE standard18-2012, 2013.

### Theses/Dissertations

[Ref number] Author’s initials. Author’s Surname, “Title of thesis,” Designation type, Abbrev. Dept., Abbrev. Univ., City of Univ., State, Year.

[10] J. O. Williams, “Narrow-band analyser,” Ph.D. dissertation, Dept. Elect. Eng., Harvard Univ., Cambridge, MA, 1993.

### Datasheets

[Ref number] Author’s initials. Authors Surname, “Title of Datasheet,” Part datasheet, Publication date [Latest revision date].

[11] Texas Instruments, “High speed CMOS logic analog multiplexers/demultiplexers,” 74HC4051 datasheet, Nov. 1997 [Revised Sept. 2002].

### Online Documents

If you are using documents such as a report, conference paper, standard, patent or thesis online and it also exists as an identical print equivalent i.e. with the same format and pagination, it can be usually be referenced as the print version.

If it is e-only, you can make the standard reference template an electronic version by adding the material type in square brackets

e.g. [Online] after the document title. If there is no specific document title you can place this after the document number (e.g. patent number).

At the end of the reference add: Available: URL. See below for an example of an online patent:

[12] M.R. Brooks, “Musical toothbrush with adjustable neck and mirror,” U.S Patent *326189* [Online], May 19 1992. Available: http://goo.gl/VU1WEk

### Websites

Note: Include as much of the key information as you can find for a given website. If a web page has no personal author, you can use a corporate author. Failing that, you can use either Anon. (for anonymous) or it is permissible to use the title of the site.

[Ref number] Author’s initials. Authors Surname. (Year, Month. Day). *Title of web page* [Online]. Available: URL

1. BBC News. (2013, Nov. 11). *Microwave signals turned into electrical power* [Online]. Available: http://www.bbc.co.uk/news/technology-24897584

1. M. Holland. (2002). *Guide to citing internet sources* [Online]. Available: http://www.bournemouth.ac.uk/library/using/guide\_to\_citing\_internet\_sourc.html