

**A STUDY OF FACTORS AFFECTING THE PRINCIPLES IN DESIGNING REUSABLE COMPONENTS**

***in partial fulfillment for the award of the degree***

***of***

**Bachelor of Engineering**

**in**

**Computer Science and Engineering**

**Dr. Mahalingam College of Engineering and Technology**

**Pollachi - 642003**

**An Autonomous Institution**

**Affiliated to Anna University, Chennai - 600 025**

**MAY 2014**

**MINI PROJECT REPORT**

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**EXTERNAL EXAMINER**

**INTERNAL EXAMINER**

Submitted for the Autonomous End Semester Examination Mini Project

viva-voce held on <<DD-MONTH in Words-YYYY>>

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who carried out the project work under my supervision.

AJITH KUMAR U. (13BCS100)

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Certified that this mini project report, “A STUDY OF FACTORS AFFECTING THE PRINCIPLES IN DESIGNING REUSABLE COMPONENTS”

is the bonafide work of

BONAFIDE CERTIFICATE

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A STUDY OF FACTORS AFFECTING THE PRINCIPLES IN DESIGNING REUSABLE COMPONENTS

ABSTRACT

The abstract should provide an overview of the whole project. It should briefly and precisely define the problem addressed. The abstract should also mention the method used and the implementation details. The abstract must also summarize the results and conclusions.

The abstract may have multiple paragraphs. However, the abstract must confine to a single page OR limited to 250 words, whichever is lesser. The abstract and the acknowledgement sections must have paragraphs with a line spacing of 1.15. The rest of the report must have a line spacing of 1.5. The total number of words in the document is not expected to be more than 10,000 words(not more than 40 pages).

ACKNOWLEDGEMENT

The acknowledgement section must acknowledge key assistance and funding sources. The acknowledgement section may also have multiple paragraphs. However, this section must confine to a single page OR limited to 250 words, whichever is lesser. The abstract and the acknowledgement sections must have paragraphs with a line spacing of 1.15. The rest of the report must have a line spacing of 1.5. The total number of words in the document is not expected to be more than 10,000 words.

LIST OF ABBREVIATIONS (in alphabetic order)

°C : Degree Celsius

2-iP : N6-(2-isopentyo) adenine

AIR : All India Radio

|  |  |
| --- | --- |
| CH3Br : | Methyl Bromide |

EF-MPR : Energy Efficient – Multi-Point Relay

|  |  |
| --- | --- |
| et al. | : and others |

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1. INTRODUCTION

The introduction section must properly introduce the project concentrating primarily on the problem definition and motivation for the project. The introduction and subsequent sections of the report must have a line spacing of 1.5. Please note that the total number of words in the document is not expected to be more than 10,000 words.

The rest of the chapters may be decided based on the guidelines as provided by the department and the nature of the project. The students are expected to discuss with their Supervisor and department Project Coordinators to finalize on the chapters.

* 1. Second Level Heading - 1

This is a sample paragraph to illustrate the text under the second level heading of the project report. The rest of the chapters may be decided based on the guidelines as provided by the department and the nature of the project. The students are expected to discuss with their Supervisor and department Project Coordinators to finalize on the chapters.

* 1. Second Level Heading - 2

This is a sample paragraph. The rest of the chapters may be decided based on the guidelines as provided by the department and the nature of the project. The students are expected to discuss with their Supervisor and department Project Coordinators to finalize on the chapters.

* + 1. Third Level Heading

This is a sample paragraph to illustrate the text under the third level heading of the project report.

* + 1. Figures and Table

Numbering of the figures and tables must be continuous throughout the project report. The caption for a figure must be given below the figure while the captions for tables must be above the tables. The figures must follow the numbering scheme using Arabic Numerals (1,2,3,…) and the tables must follow the Roman Numerals (I, II, III, …). Both the figures and tables must be aligned to the center. The figures and tables must be referenced in text as given in the next paragraph.

**Error! Reference source not found.** shows the World Economic Pyramid with the caption below the figure. Table I shows a sample table with caption above the table. The MCET logo is as shown in **Error! Reference source not found.Error! Reference source not found.**. It is recommended that figures and tables be inserted into the main body of text as ‘References’ and not just merely typed in.

Figure 1. MCET Logo

Figure 2. World Economic Pyramid (image source: [[1](#_ENREF_1)])

For tables that span across more than one page, the header column must be ensured to be repeated on top of all new pages.

Table I. Sample Table Caption

| **SL. No.** | **Task Name** | **Start Date** | **End Date** | **Task Description** |
| --- | --- | --- | --- | --- |
| 1 | Proposal | 16-Dec-13 | 30-Dec-13 | * Submission and follow-up
 |
| 2 | Lab Initiation  | 6-Jan-14 | 28-Apr-14 | * Setting up the lab space and the supporting infrastructure (including hardware, software, and internet connectivity)
 |

It is also recommended that figures be in grey scale. That would enable the readers to interpret the figures even if they are viewed through a grey scale printout. If the figures are in color, it must be made sure they can be interpreted through a grey scale printout.

* + 1. Mathematical Equations

Mathematical equations must be numbered using Arabic Numerals. It is recommended that Microsoft Equation objects are used to represent mathematical equations. Equation 1 shows a sample equation.

 (1)

* + 1. References

It is recommended that IEEE citation style be used citations within the project report. However, a different citation style may be used as per department guidelines. An example citation is already given in the caption for **Error! Reference source not found.**. Citations maybe done as given in the paragraph below. Please note that the paragraph below has references to different types of citations including Journals, Conference Proceedings, Workshops, and Books. An example of website citations is as given in the citation in the caption for **Error! Reference source not found.**. For any other type of citation, please make sure you follow it consistently as given by IEEE (or as per department guidelines).

Approaches to measuring reuse and reusability can be found in [[2](#_ENREF_2)]. Software reuse in industry has been studied and its benefits analyzed [[3-9](#_ENREF_3)]. Many reuse design principles have been proposed [[10](#_ENREF_10), [11](#_ENREF_11)].

* + 1. Code or Program

For specific guidelines on how to present and refer to any software code or program, please refer to Appendix Section A.2.

* 1. Page Layout

The default layout for the pages is Portrait on A4 size with margins: Left – 4cm, Right – 2cm, Top – 3cm, and Bottom – 3cm. For specific content that needs to be included in the Landscape layout, it shall be done but with the same margin settings as for the portrait layout. Also, the text must be readable top to bottom as for left to right in the portrait layout.

1. Sample Chapter

This is a sample paragraph. The rest of the chapters may be decided based on the guidelines as provided by the department and the nature of the project. The students are expected to discuss with their Supervisor and department Project Coordinators to finalize on the chapters.

References

[1] C. K. Prahlad and S. L. Hart. (2013, 04 December 2013). *The Fortune at the Bottom of the Pyramid*. Available: <http://www.strategy-business.com/article/11518?pg=all>

[2] W. Frakes and C. Terry, "Software reuse: metrics and models," *ACM Computing Surveys,* vol. 28, pp. 415-435, 1996.

[3] R. van Ommering, "Software reuse in product populations," *IEEE Transactions on Software Engineering,* vol. 31, pp. 537-550, 2005.

[4] W. B. Frakes and G. Succi, "An industrial study of reuse, quality, and productivity," *Journal of Systems and Software,* vol. 57, pp. 99-106, 2001.

[5] P. Mohagheghi and R. Conradi, "An empirical investigation of software reuse benefits in a large telecom product," *ACM Transactions on Software Engineering Methodology,* vol. 17, pp. 1-31, 2008.

[6] W. C. Lim, "Effects of Reuse on Quality, Productivity, and Economics," *IEEE Software,* vol. 11, pp. 23-30, 1994.

[7] S. Morad and T. Kuflik, "Conventional and open source software reuse at Orbotech - an industrial experience," in *Proceedings. IEEE International Conference on Software - Science, Technology and Engineering*, Herzelia, Israel, 2005, pp. 110-117.

[8] H. Nakano, Z. Mao, K. Periyasamy, and W. Zhe, "An Empirical Study on Software Reuse," in *International Conference on Computer Science and Software Engineering*, Hubei, China, 2008, pp. 509-512.

[9] M. Ramachandran and W. Fleischer, "Design for large scale software reuse: an industrial case study," in *Proceedings of Fourth International Conference on Software Reuse, ICSR '96*, Orlando, FL, 1996, pp. 104-111.

[10] W. B. Frakes and D. Lea, "Design for Reuse and Object Oriented reuse Methods," presented at the Sixth Annual Workshop on Institutionalizing Software Reuse (WISR '93), Owego, NY, 1993.

[11] J. Sametinger, *Software engineering with reusable components*. Berlin Heidelberg, Germany: Springer Verlag, 1997.

1. Sample Appendix

This is a sample paragraph to illustrate the text under the first level heading in an Appendix of the project report.

* 1. Sample Appendix Second Level Heading

This is a sample paragraph to illustrate the text under the second level heading in an Appendix of the project report.

* + 1. Sample Appendix Third Level Heading

This is a sample paragraph to illustrate the text under the third level heading in an Appendix of the project report.

* + 1. Appendix page numbering

Page numbering for the Appendix sections must be followed as A.1, A.2, A.3,… for Appendix A; B.1, B.2, B.3,… for Appendix B; and so on...

* 1. Sample Code or Program in Appendix

Any sample code or program to be in included in the report must use the Courier New font style and a size of 10. For example, given below is a code for a file named stemmer.java. It is also recommended that line numbers are provided for the code or program. Any text related to the code or program being mentioned in the text must also be of Courier New font style and a size of 10.

**One-use Stemmer Component: stemmer.java**

01: public class SStemmer {02: public static void main(String[] args) {03: System.out.println("S Stemmer");04: System.out.println("Enter a single word to stem and press return.");05: System.out.println("Type quit to quit.");06: 07: Scanner in = new Scanner(System.in);08: 09: System.out.print("Enter word to stem: > ");10: 11: while(in.hasNextLine()) {12: String input = in.nextLine();13: 14: if(input.equalsIgnoreCase("quit")) return;15: 16: System.out.println(input + " -> " + stem(input));17: System.out.println();18: System.out.print("Enter word to stem: > ");19: 20: }21: } 22: public static String stem(String s) {23: String result = s;24: 25: if(s.endsWith("ies") && !(s.endsWith("eies") || s.endsWith("aies"))) {26: result = s.substring(0, s.length()-3) + "y";27: }28: else if(s.endsWith("es") && !(s.endsWith("aes") || s.endsWith("ees") || s.endsWith("oes"))) {29: result = s.substring(0, s.length()-2) + "e";30: }31: else if(s.endsWith("s") && !(s.endsWith("us") || s.endsWith("ss"))) {32: result = s.substring(0, s.length()-1);33: }34: 35: return result;36: }37: }

1. Second Sample Appendix