Department of Computer and Information Sciences
School of Arts and Sciences
University of San Carlos

Capstone Proposal Guidelines and Documentation Format

This capstone proposal document format aims to guide the capstone students of the Department of Computer and Information Sciences in writing capstone paper. Comments and suggestions are continually welcome for the improvement of the capstone program.

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TABLE OF CONTENTS

Section 1. What is Capstone Project?	…	Pg. 3
Section 2. Scope of the Capstone Project	…	Pg. 4
Section 3. Suggested Areas for Capstone Project	…	Pg. 5
Section 4. Suggested Themes for Capstone Project	…	Pg. 6
Section 5. Capstone Project Duration	…	Pg. 6
Section 6. Composition of Capstone Groups	…	Pg. 7
Section 7. Adviser Composition	…	Pg. 7
Section 8. Presentation of the Capstone and Publication	…	Pg. 9
Section 9. Capstone Proposal Guidelines	…	Pg. 10
Section 10. Capstone Proposal Documentation Format	…	Pg. 13
Section 11. Intellectual Property (IP) Rights	…	Pg. 34
Section 12. Ethics Review	…	Pg. 34
References	…	Pg 34

Section 1. What is Capstone Project?

CAPSTONE PROJECT

- Capstone is required for BSIT and BSICT. It functions as terminal project requirements that would not only demonstrate a student's comprehensive knowledge of the area of study and research methods used but also allow them to apply the concepts and methods to a specific problem in their area of specialization.

- A Capstone Project is an undertaking appropriate to a professional field. It should significantly address an existing problem or need.

- An IT and ICT Capstone Project focuses on the infrastructure, application, or processes involved in implementing a Computing solution to a problem.

- Must complete a capstone project in the form of an
    - IT application
    - Multimedia Systems development
    - IT Management Project

- A thesis or capstone project builds and tests the skills and the knowledge acquired during the education and is an essential part of the training towards becoming a professional.

- Software development projects / special problems

- It is expressly understood that Computing Thesis and Capstone Projects need not require surveys, statistics, and descriptive methods, unless appropriate.

RESEARCH IN COMPUTING

- Systematic method of problem solving

- Use of scientific method

    - Collecting data
    - Formulating a hypothesis or proposition
    - Testing the hypothesis
    - Interpreting results

- Stating conclusions that can be later be evaluated independently by others.

Section 2. Scope of the Capstone Project

- The Thesis or Capstone Project should integrate the different courses, knowledge, and competencies learned in the curriculum. Students are encourages to produce innovative results, generate new knowledge or theories, or explore new frontiers of knowledge or application areas.

- Should integrate the different courses, knowledge, and competencies learned in the curriculum. Students are encourages to produce innovative results, generate new knowledge or theories, or explore new frontiers of knowledge or application areas.

- For IT Capstone Projects, recommended infrastructure and its implications on other systems should be clearly specifies in the final report with the introduction of the project.

- The thesis adviser should determine the appropriate complexity level of the specific problem being addressed and the proposed solution, considering the duration of the project, the composition of the team, and the resources available.

Section 3. Suggested Areas for Capstone Project

- Software Development
  - Software Customization
  - Information Systems Development for an actual client (with pilot testing)
  - Web Applications Development (with at least alpha testing on live servers)
  - Mobile Computing Systems

- Multimedia Systems
  - Game Development
  - E-Learning Systems
  - Interactive Systems
  - Information Kiosks

- Network Design and Implementation and Server Farm Configuration and Management
- IT Management
  - IT Strategic Plan for sufficiently complex enterprise

- IT Security Analysis, Planning and Implementation

Students are encouraged to think of Start Up ideas!

Section 4. Suggested Themes for Capstone Project

- The following are Research Themes or Agenda of University of San Carlos:
    - Food
    - Health
    - Water
    - Waste
    - Energy
    - Disaster and Risk Management
    - Governance
    - Education
    - Business

- How can IT and ICT be able to contribute to these agenda?

Section 5. Capstone Project Duration

- Students are given ample time to finish their capstone project.

- Students will enrol two semesters to complete their capstone project

    Information Technology

    - IT 3301 Capstone Project I (3 units)
    - IT 4101 Capstone Project II (3 units)

    Information and Communications Technology

    - ICT 201N Capstone Proposal (3 units)
    - ICT 146 Capstone Project (3 units)
- An instructor is assign to handle the course and coordinate with Students and Advisers.

Section 6. Composition of Capstone Groups

- Students should preferably work in teams of four (4) members depending on the complexity of the project. The adviser should be able to determine whether the team can complete the project on time.

- Multidisciplinary teams are also encouraged, provided that team members prepare separate documentations per program

Section 7. Adviser Composition

PANEL COMPOSITION

- The Project is prepared under the guidance of an adviser and presented and accepted by a Panel composed of at least 3 members: Chair of the Panel and 2 members of the Panel.

- Chair
  - policy same as Adviser's qualification, preferably domain expert
- Panel Member 1
  - Faculty Member with undergraduate or graduate degree ; Full time or Part time Faculty)
- Panel Member 2
  - Faculty Member with Industry Experience or Someone from the Industry

ADVISER/ PANEL QUALIFICATION

- The adviser must have at least a Master's Degree.

- The adviser must have completed a computing project successfully beyond bachelor's degree project or must have experienced and completed a Thesis or Capstone Project.

- An adviser must have an experience in:
  - design and create algorithmically software
  - develop new and effective algorithms for solving computing problems.
  - design and develop computing solutions using a system-level perspective

- As much as possible, the adviser should be a full-time faculty member of the HEI. Otherwise a full-time faculty co-adviser is required.

- Advisers and Panel Members should have a degree in a Computing or Allied programs, or must be a domain experts in the area of study.

- At least one of the panel members must have a master's degree in Computing (preferably in the same field as the thesis or project) or allied program.

- For IT or ICT at least one of the panel members should preferably have an industry experience.

- The adviser must be able to guide the students throughout the whole project life cycle, including the thesis/capstone project defense and possible project deployment.

ADVISER'S ROLE

- Must guide the advisee to conceptualize the Research or Capstone Topic.

- Must be involved in the accomplishment of completion of (Chapter 1-4 of Proposal Document) and (Chapter 1-6 of Final Document).

- Must be able to guide the students throughout the whole project life cycle, including the thesis/capstone project defense and possible project deployment.

- Must guide their advisees to secure the following (if applicable)
    - Ethics Clearance Form
    - Consent Forms

- Responsible to submit Student's work in Conference Proceedings or Journal.

Section 8. Presentation of the Capstone and Publication

- Capstone Project must be presented in a public forum.

- This forum may be an international, national, regional or school-based conference, meeting, or seminar that is announced and open to interested parties.

- A separate from the presentation before the Panel.

- There is an annual culminating event held at the end of the School Year: Best Thesis and Capstone Awarding Ceremony with Panel Members from the Industry.

- Additional requirements from students is to produce Paper in Publication format (for submission to conference o journal)
    - Adviser becomes a co-author
    - Students are the main author

Section 9. Capstone Proposal Guidelines

CAPSTONE PROPOSAL DOCUMENT FORMAT GUIDELINES

- Paper and Font. Use 8.5 X 11. Use one side of the page only. Use Arial for font style and font size 12-point.
- Margins. Left 1.5 inches; top, bottom, and right, 1 inch.
- Spacing. Use 1.5 spacing for the text. Use single space for table and figure captions.
- Figures and Illustrations. Figures, tables, graphs, etc., should be positioned and labeled appropriately. Figure # should be placed bottom center of the figure. Table # should be placed upper left of the table.

  Figures:
  - A figure is any type of illustration other than a table (chart, graph, photograph, or drawing).
  - Use figures to complement information in text or to simplify text.
  - Number figures in the order they are first mentioned in text. Do not write “the figure above” or “the figure below.”
  - Ensure that figures are simple, clear and consistent in presentation and vocabulary.
  - Ensure data are plotted accurately and the grid scale is proportioned.
  - Place labels close to the identified item.
  - Axis labels on graphs should be parallel to their axes.
  - Captions include the figure title and a brief, but descriptive, explanation of the figure.
  - Use 1.5 the caption and place it below the figure.
  - The figure legend should be positioned within the borders of the figure.

  Example

  The following figure and note are each adapted from the Publication Manual of the American Psychological Association (APA, 2001, pp. 182-183).

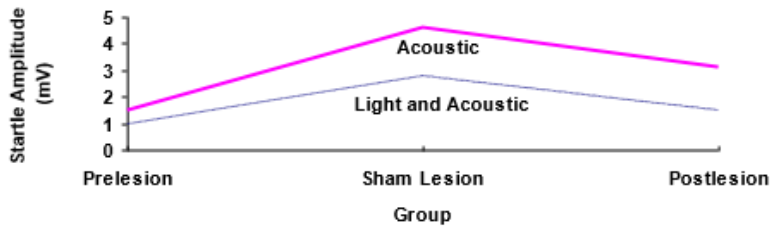


Figure 1. Mean amplitude startle response for prelesion, sham lesion, and postlesion groups in acoustic and light-and-acoustic test conditions.

Tables:

- Use tables for the purpose of simplifying text. A table with 2 or fewer columns and rows should be presented in text format instead of a table.
- Number tables in the order they are first mentioned in text. Do not write “the table above” or “the table below.”
- Be consistent in the formatting and vocabulary of all tables when writing a paper.
- Apply 1.5 spacing of the entire table
- Ensure that your table title is brief but explanatory.
- Italicize the table title. Do not italicize the table number
- Standard abbreviations and symbols, such as % or no. may be used in headings without further explanation.
- Ensure each column has a heading
- Capitalize only the first letter of the first word of all headings. If a word is a proper noun, however, be sure to capitalize the first letter anyway.

Example

See Table 1 as a guide to the formatting of a table. This table is an example from the Publication Manual of the American Psychological Association (APA, 2001, p. 149). The fictitious general note has been included as an example.

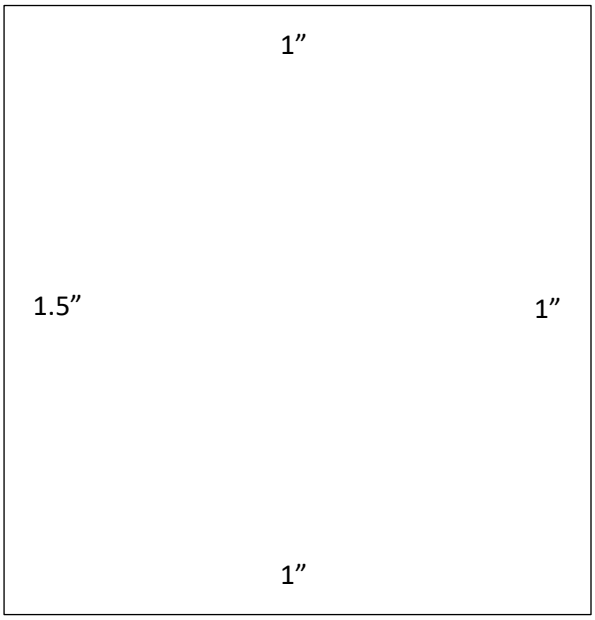
Table 1

Error Rates of Older and Younger Groups

Level of difficulty	Mean error rate		Standard deviation		Sample size	
	Younger	Older	Younger	Older	Younger	Older
Low	.05	.14	.08	.15	12	18
Moderate	.05	.17	.07	.15	15	12
High	.11	.26	.10	.21	16	14

- Page Number. Show page number at the bottom right side of the page
- Title Page. No page number but counted as page i
- Approval Sheet. No page number but counted as page ii
- Acknowledgement. Counted as page iii. Page number shown
- Abstract. Counted as page iv. Page number shown
- Table of Contents. Counted as page v. Page number shown
- List of Figures. Counted as page vi. Page number shown
- List of Tables. Counted as page vii. Page number shown
- Chapter 1. Begin page number at 1, page number is shown and onwards

White Short Bond Paper (8.5” X 11”)

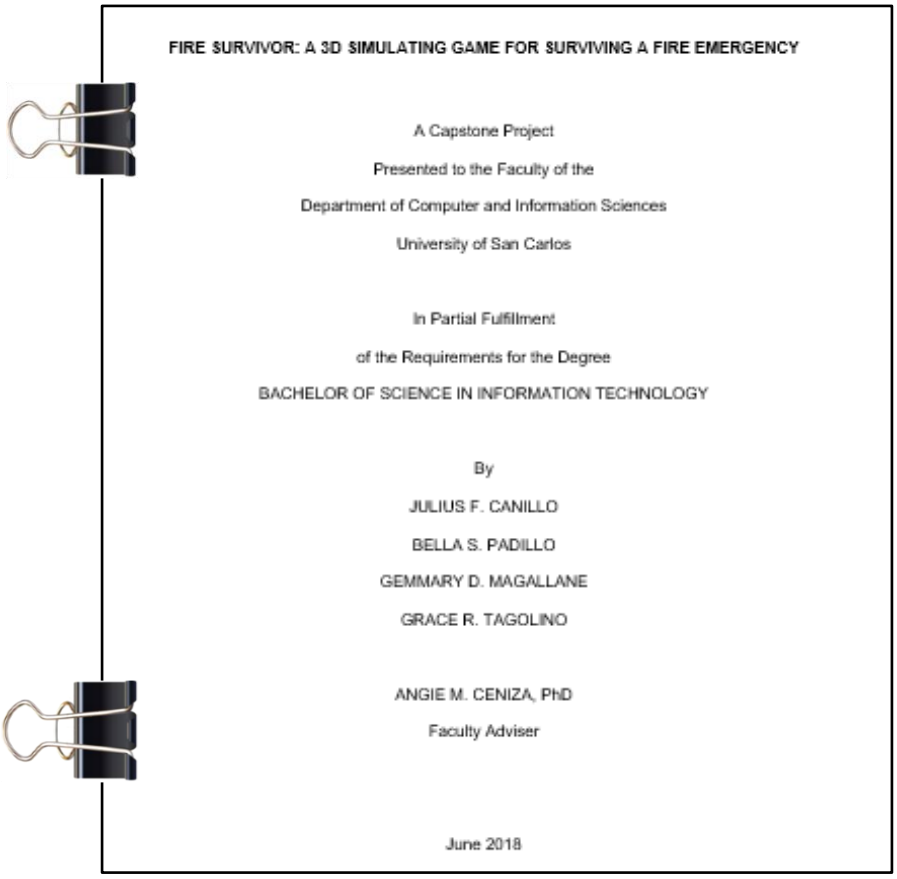


PROPOSAL ORAL EXAMINATION GUIDELINES

A capstone proponent is eligible for **PROPOSAL ORAL EXAMINATION** only if

a. Capstone adviser recommends the capstone by signing the **SWORN STATEMENT AND RECOMMENDATION** Form;
b. Three copies of the capstone document must be submitted to your **CAPSTONE COURSE INSTRUCTOR** on **November 16, 2018.**

Printing. (For Oral Defense Only). Bind your printed Capstone document using clear folder with slide or binder paper clip: Secure three copies for the members of the panel.



FIRE SURVIVOR: A 3D SIMULATING GAME FOR SURVIVING A FIRE EMERGENCY

A Capstone Project

Presented to the Faculty of the

Department of Computer and Information Sciences

University of San Carlos

In Partial Fulfillment

of the Requirements for the Degree

BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY

By

JULIUS F. CANILLO

BELLA S. PADILLO

GEMMARY D. MAGALLANE

GRACE R. TAGOLINO

ANGIE M. CENIZA, PhD

Faculty Adviser

June 2018

Approval Sheet. Print three copies of your Approval Sheet with the names of the capstone committee indicated. Have it signed by members of panel after you have compiled all the revisions needed.

c. The three possible verdicts after the defense are:

ACCEPT WITH REVISIONS. Minor revisions are necessary to enhance the document, but they do not have to be presented in front of the panelists. The panelists are tasked to make sure that all the revisions are made.

REDEFENSE. Another formal defense is necessary because the proponent failed to present his/her capstone properly and/or the documentation and/or software contain major errors.

NOT ACCEPTED. Either the objectives of the study have not been met or the proponent cheated. The verdict is a unanimous decision among the three members of the capstone defense panel. Once issued, it is final and irrevocable.

It is encouraged that the students schedule their defenses earlier, this is to give the students more time to revise the final capstone for verdicts of **'ACCEPT WITH REVISIONS'** or **'REDEFENSE'**. It also allows the student to improve or redo their final capstone in cases of **'NOT ACCEPTED'**.

d. After revisions are made, process **CAPSTONE PROPOSAL COMPLIANCE FORM**

e. Present to your **CAPSTONE COURSE ADVISER** the **APPROVED CAPSTONE DOCUMENT** with three (3) original copies of the **APPROVAL SHEET** and **CAPSTONE PROJECT COMPLIANCE FORM** for **PRINTING APPROVAL**

Section 10. Capstone Proposal Documentation Format

(Sample Title Page)

FIRE SURVIVOR: A 3D SIMULATING GAME FOR SURVIVING A FIRE EMERGENCY

A Capstone Proposal

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June 2018

ABSTRACT

This section of the capstone document highlights the findings of the study. From 150 to 200 words of short, direct and complete sentences, the abstract should be informative enough to serve as a substitute for reading the capstone itself. Do not put citations or quotes in this section. Avoid beginning the abstract with “This paper/document/thesis/study/project/…”

The abstract structure consists of the following:

- **Background:** A simple opening sentence or two placing the work in context.
- **Aims:** One or two sentences giving the purpose of the work.
- **Method(s):** One or two sentences explaining what was (or will) be done.
- **Results:** One or two sentences indicating the main findings (or what you hope to accomplish with the project).
- **Conclusions:** One sentence giving the most important consequence of the work – what do the results mean? How will they be used?

TABLE OF CONTENTS

ABSTRACT ii
TABLE OF CONTENTS iii
LIST OF FIGURES iv
LIST OF TABLES v
CHAPTER 1 INTRODUCTION 1
1.1 Rationale of the Study 1
1.2 Statement fo the Problem 3
1.2.1 General Objective 3
1.2.2 Specific Objectives 3
1.3 Significance of the Study 3
1.4 Scope and Limitations 4
CHAPTER 2 RELATED SYSTEMS 6
CHAPTER 3 TECHNICAL BACKGROUND 11
CHAPTER 4 DESIGN AND METHODOLOGY 14
4.1 Conceptual Framework 15
4.2 Analysis and Design 16
4.3 Development Method 17
4.4 Development Approach 18
4.5 Software Development Tools 19
4.6 Project Management 20
4.6.1 Schedule and Timeline 20
4.6.2 Responsibilities 20
4.6.3 Budget and Cost Management 21
4.7 Verification, Validating and Testing 2
BIBLIOGRAPHY 24
Appendix A Transmittal Letter
Appendix B Interview Guide
Appendix C Questionnaire
Appendix D Sofware Requirements Specifications
CURRICULUM VITAE

LIST OF FIGURES

Figure 1: Architectural Background 7
Figure 2: Entity Relationship Diagram 10

LIST OF TABLES

Table 1: Summary of Approaches and Features 6
Table 2: Summary of Hard and Soft Constraints 12

CHAPTER 1
INTRODUCTION

1.1 Rationale of the Study

This section begins discussing the research problem itself. This presents situations that lead to the conceptualization of the study. Convince reader why the problem is important. You may use statistics to add depth and add historical account of recent research literature within the past 5 years. Avoid verbatim quotes except for key definitions. This is a form of plagiarism even with citations!

Discuss key concepts and methods. Discuss the content in your own thoughts in your own words, confirmed by other background information. It is organized to move from general information to specific information. The background must be summarized succinctly, but it should not be itemized. Limit the introduction to studies that relate directly to the present study. End the introduction by explicitly declaring the novelty of your work or your specific contribution. The last sentence is usually a statement of your general objective.

Hint in organization: Start with the big picture about your topic, something that readers will identify in concrete term (non-technical), and then limit the problem, gradually focusing on your topic and gently lead the reader to your research problem and justification for choosing it. (Funnel –shape structure). Format of citations and quotations will be based from the APA format. This section must be 1-2 pages long.

1.2 Statement of the Problem

This section states what the research intends to do. This section consists of 2 sub sections: General Objective and Specific Objectives.

1.2.1 General Objective

This section is a general statement on the intent and direction of the research. It describes the purpose of the research.

1.2.2 Specific Objectives

This consists of clear statements of the intended outcomes, all which can be measured in some way. The SMART (Specific, Measurable, Achievable, Realistic and Time-bound) objectives should break your capstone proposal into major stages and state an output, which would guide you in planning and negotiating your work with your supervisor.

1.3 Significance of the Study

This section presents the importance and contribution of the research to the individuals, groups, institutions and to the discipline. Mention who are to benefit from the research and how each maybe benefited.

1.4 Scope and Limitations

This section discussed the extent of the study and what limitations are there. This section must state the weaknesses and limitation of the study.

CHAPTER 2
RELATED SYSTEMS

This chapter is a review of research works done by others that relate to what you hope to demonstrate with your work. This is also where the literature related to methods that you used in your work should be introduced. This part of your capstone document will form the bulk of your citations.

This chapter is an examination and discussion of the literature and systems in a given area of study. It is a concise overview of what has been studied, argued, and established about a topic, usually organized chronologically or thematically. It is more than an annotated bibliography or a summary, because you are organizing and presenting your sources in terms of overall relationship to your own study. It evaluates previous and current research in regards to how relevant or useful it is and how it relates to your own research. This chapter must be at least 5 pages long and must at least contain 20-30 author citations.

Suggested Content based from PSITE Undergraduate Research and Capstone Project Manual

- An organizational pattern that combines both summary and synthesis to give new interpretations of old material or combine new with old interpretations;
- A tracing of the intellectual progression of the field, including major debates
- An evaluation of the sources and an advise to the reader on which of the materials cited are the most pertinent or relevant in the thesis or capstone
- A review of related systems contains description of existing systems that are relevant to the proposed thesis.
- Discussion of specific features of other systems that you intend to replicate and improve will help define what is to be expected in your project.

Suggested Format from PSITE Undergraduate Research and Capstone Project Manual

- A logical flow of ideas
- Current and relevant references with consistent, appropriate referencing style

- Proper use of terminology
- An unbiased and comprehensive view of the previous research on the topic

Suggestion in organization: Usually starts in general and gradually progresses into published research most related to your specific research's emphasis. Describe the general themes in the research related to your topic. Any gaps in the published research are noted, particularly if the project addresses the gaps. The literature review moves from what is currently published and known about the topic to what your research is going to add to the topic. Include why the particular researches focus is important and how it differs from previous research on the topic.

You may present figures and tables if necessary in this section. Figures must be labeled. Figure labels are placed at the bottom of the figure center aligned. Table labels are placed at the top of the table and left aligned.

For relevant sources refer to Journals in Computer Science or make extensive use of the online sources available in the USC library these include: ACM Digital Library, Academic OneFile, Proquest, Science Direct, EBSCO & Springerlink. For more information on how to use and access this online sources visit Josef Baumgartner Learning Resource Center (JB-LRC) and ask assistance from Ms. Marcie of Serials Library Section.

CHAPTER 3

TECHNICAL BACKGROUND

This section may include a comprehensive discussion of theorems, definitions, fundamental algorithms, mathematical models, and/or formulas relevant in the study. This chapter should be elaborated as much as possible in layman's terms.

The technical background must be written in narrative form. Subheadings are recommended for descriptions that are substantially long. Items are arranged by order of importance or theme Aside from texts, the author may put tables, graphs, illustration, pictures and other relevant information as necessary (PSITE Undergraduate Research and Capstone Project Manual).

CHAPTER 4
DESIGN AND METHODOLOGY

The design is a blueprint of the concept of the proposed research project. It specifies the conceptual structure of what the project proponents will do. It provides an outline of the phases and sub-phases that will help the proponents be guided in their choice of techniques that are most appropriate at each stage of the research project. It will also help the project proponent plan, manage, control and evaluate computing research project.

The methodology is defined as collection of procedures, techniques, tools, and documentation aids which will help the proponents in their effort to solve computing problems. Contents of this chapter include the following section:

4.1. Conceptual Framework

It is narrative description of the design to achieve your project objectives. Most of the concept is illustrated in a graphical diagram to visually present the structure of the concept of the research or project (conceptual framework). This also provides the manual process and the proposed process of the proposed project.

4.2. Analysis and Design

It is either Structured or Object-oriented approach (introduce UML, ER Diagrams if possible). Present Wireframe or User Interface of different modules.

4.3. Development Model

It may include any of the following models: Conventional waterfall-type, Incremental, Throw-away prototyping, Evolutionary prototyping or any other software development model.

4.4. Development Approaches

It may include either Top down or Bottom-up approach of development.

4.5. Software Development Tools

It should contain the discussion about the programming language tools to be used specifically on: Front and Back-end; Reuse or not; Open vs. licensed software; Criteria of selecting it such as maintainability, support, HCI capability, database connectivity, simplicity and learning.

4.6. Project Management

This section of the document includes subsections on Schedule and Timeline, Responsibilities and Budget and Cost Management.

4.6.1 Schedule and Timeline

It may contain Gantt chart, Activity Graph, Critical Path Analysis and other scheduling techniques that will list the activities to be done in order to achieve the objective. Usually it includes the phases its sub-phases of the systems development life cycle.

4.6.2 Responsibilities

It should contain the assignment modules and activities to be done by each team member.

4.6.3 Budget and Cost Management

It should contain a detailed budget proposal and how each cost is to be managed effectively in the conduct of research or study.

4.7. Verification, Validation and Testing

It should include the plan of activities to: verify if you are developing the system right, validate if you are developing the right system, and test the system if it works correctly without any bugs or errors. Most importantly, use of any quantitative and qualitative measures should be planned in order to achieve the research projects specific objectives

The items 4.3-4.11 are suggested content from PSITE Undergraduate Research and Capstone Project Manual

BIBLIOGRAPHY

Only sources that were used or cited in the research work are included at least containing 20-30 author citations for undergraduate thesis (Masters may contain at least 50, PhD at least 100). Bibliography section of the document will use American Psychological Association (APA) style format. Entries in the bibliography listing must be sorted alphabetically by categories. The following are the suggested categories.

Book

Journal Article

Conference Proceedings Article

Web Article

APPENDICES

Appendices are blocks of relevant data and information presented at the end of the documentation. An appendix section gives the readers additional explanations on topics or discussions. Always provide at least one paragraph to introduce the material being provided in each of the appendix chapter.

Plural (appendices) singular (appendix)

If two or more appendices are included in a proposal, they should be designated Appendix A, Appendix B, etc.

List of appendices applicable during proposal stage

- Transmittal Letter
- Interview Guide
- Questionnaire
- Software Requirements Specifications

Appendix A
TRANSMITAL LETTER

April 25, 2018

FO1 Oiretuele C. Baguio
Firefighter, Central Fire Station (Gun-ob)
Bureau of Fire Protection

Dear Mr. Baguio,

Greetings!

May we request from you the permission to gather information from you and the Bureau of Fire Protection for our research study entitled “FIRE SURIVOR: A 3D SIMULATING GAME FOR SURVIVING FIRE EMERGENCY".
The above research study is a requirement for the completion of the degree in Bachelor in Science in Information and Communication Technology in the University of San Carlos. I am confident that the result of the study would be useful and helpful in the betterment of the community.
Thank you very much. I am looking for your positive response.

Respectfully yours

Julius D. Canillo

Bella C. Padilla

Gemmary D. Magallane

Mary R. Tagolino
BSIT Students, University of San Carlos

Endorsed by:

Angie M. Ceniza, PhD
Capstone Adviser

Approved by:

Oiretuele C. Baguio
Firefighter, Central Fire Station (Gun-ob)

APPENDIX B
INTERVIEW GUIDE

APPENDIX C
QUESTIONNAIRE

APPENDIX D

SOFTWARE REQUIREMENT SPECIFICATIONS

CURRICULUM VITAE

A curriculum vitae (CV) provides an overview of a person's experience and other qualifications.

PHOTO

CONTACT INFORMATION

Name:

Address:

Telephone:

Cell Phone:

Email:

PERSONAL INFORMATION

Birthday:

Religion:

Civil Status:

EDUCATION

University of San Carlos

Bachelor of Science in Information and Communication Technology

Tertiary Level (year started – present)

University of San Carlos

Secondary Level (year started – year ended)

University of San Carlos

Primary Level (year started – year ended)

TECHNICAL SKILLS

WORK EXPERIENCE

TRAININGS

Section 11. Intellectual Property Rights

- All Thesis and Projects must not infringe on existing IP. All prior works, including open source, open content, and creative commons content, shall be properly cited.

- Copyright and other Intellectual Property Rights arising from the Thesis or Capstone Projects shall be bound by the IP Policies of the University of San Carlos approved as of April 2013.

- The major categories of IPR dealt with in the USC IP Policy are (1) copyrights, (2) trademarks, (3) patents, (4) utility models, (5) designs, (6) layout designs (topographies) of integrated circuits and (7) undisclosed information.

Section 12. Ethics Review

- The University of San Carlos Institutional Ethics Review Committee (USC-IERC) provides services to the researchers in the review of the ethical aspects of the research project.

REFERENCES:

About Computing Science Research Methodology
penned by Jose Nelson Amaral with significant contributions from Michael Buro,Renee Elio, Jim Hoover, Ioanis Nikolaidis, Mohammad Salavatipour, Lorna Stewart, and Ken Wong

Research Methodologies in Computer Science and Information Systems
Mohannad M. Ayash Alquds
Open University College of Technology & Applied Science

Research / Scientific Methods in Computer Science
Vera Goebel & Thomas Plagemann
Department of Informatics, University of Oslo

PSITE Undergraduate Research and Capstone Project Manual
Authors: Cherry Lyn Sta. Romana, Randy Gamboa, Dave Marcial, Gregg Victor

Gabbison, Allan Sioson
ISBN: 978-971-95389-0-5

Thesis Projects
A Guide for Students in Computer Science and Information Systems
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