**Thesis Guidelines, Policies and**

**Manual of Style**

**Draft as of 05 October 2010**

**(Based on CCS-ST Thesis guidelines)**

These policies and guidelines are formulated with the objective of helping the students of the Game Development Department to successfully deliver thesis projects on time. Comments and suggestions are continually welcome for the betterment of these guidelines.

Effectively Term: 3rd Trimester, SY 2013-2014

This document is subject to change without prior notice. Consult the Thesis Coordinator & Adviser regularly for updates and clarifications.

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# **1.0 Objectives**

The undergraduate thesis is a non-classroom learning environment in which students may apply the skills, methods, and theories learned throughout their stay in iACADEMY.

It has the goal of adequately preparing students for their respective careers by involving them in a group project that extends over several months; the undergraduate thesis is put in place with the following specific objectives:

1. to subject the students to a self-directed, non-classroom learning environment;
2. to provide students with a venue to correctly integrate and apply the various skills, methods, and theories learned in class;
3. to refine the student’s oral and written communication skills; and
4. to sharpen the student’s inter-personal and work-related skills.

**The Game Development (GD) program aims to train students in the designing of games. At the same time, it also prepares them for further studies in the field of computer science***.* In line with these, the GD Thesis is designed to enable the GD students to use concepts, principles and techniques learned in GD courses in the design and development of game technology.

# **2.0 Thesis Projects**

GD thesis projects are generally classified as applied research projects that are feasible and can be finished within two terms.

## 2.1. Types of Applied Research

2.1.1. Breadboard Software (Exploratory/ Experimental Research)

This involves the development of prototype game design systems. The product to be developed may already exist, but in terms of analysis, design and implementation, the students conduct the analysis by themselves, prepare a design of their own (perhaps patterned after an existing design), and write a substantial portion (not necessarily all) of its source code.

The use of relevant game libraries is allowed provided that there are sufficient design and implementation problems that remain to be solved or addressed. These projects may also attempt to demonstrate that a certain theory/algorithm/design might work. In general, the output of this type of thesis projects are by nature experimental and/or exploratory, and are considered at an initial stage of development, and will require further investigation or development to mature into usable technologies.

2.1.2. Commissioned Software

This involves the development of game programs tailored to fit the needs of a specific institution and it may be funded and/or used by them. Such thesis projects maybe extensions of the students’ practicum projects and can be classified as externally-funded projects (i.e. supported by a company or an individual who may or may not be from outside of the College). However, the members of the thesis groups must ensure that the support goes all the way until the completion of the project. Failure of the funding party to support the thesis project throughout the entire duration of the thesis will not be accepted as an excuse for the non-completion of the thesis project. Any thesis group wishes to work on this type of thesis project should inform the Thesis Coordinator before making any agreement with the company or any individual to resolve issues like ownership of the thesis project, confidentiality agreement and memorandum of agreement.

2.1.3. Application-Based Project

This type of thesis project is similar to that of commissioned game wherein the development of game programs are tailored to fit the needs of a specific organization, industry, or government and that it may be paid for and/or used by them. However, the emphasis on this type of thesis project is on the game engineering processes and methodologies.

## 2.2. Scope of the Thesis Work

The thesis adviser must ensure that the thesis is feasible and/or attainable within **one school year**. The major activities include:

* Analysis and Design
* Developmental Work
* Concluding Work

# **3.0 Thesis Stages**

The entire thesis program officially starts with the thesis proposal (GDTHES1) and ends with the submission of an approved thesis document and other deliverables (GDTHES2). At the end of each stage, each thesis group must submit specific deliverables for evaluation and acceptance by the thesis adviser.

For all the stages of the thesis project, the criteria used when deliberating the defense verdict include:

* complete and acceptable deliverables;
* a well-prepared and delivered presentation; and
* a productive Question and Answer session.

At the end of any defense activity in a particular thesis course, the thesis group is given a **Revisions List and Verdict Form** which contains a list of items the thesis group is expected to fulfill. The contents of this form are assumed valid and final if they are agreed upon by both the thesis group and the thesis panel committee. This validation is by affixing the signature of the lead panelist and a representative from the thesis group. The thesis group must photocopy the form, which serves as the group’s copy and return the original copy to the Thesis Coordinator on the same day no later than 1700H. In the event that the defense goes beyond the said time, the thesis group is allowed to submit the original copy on the following open campus/working day. Failure to do so would result in a failing mark.

## 3.1. GAME DEVELOPMENT Project 1 (GDTHES1)

GDTHES1 involves the identification of a thesis problem/project. This stage consists of the following activities:

* forming of thesis groups;
* identification of the research problem/project;
* specification of research objectives, scope and limitations;
* search and review of related literature;
* initial investigation of existing solutions to the identified problem(s); and
* evaluation of the thesis proposal through a proposal defense

**The only deliverable at the end of this stage is an approved thesis proposal.** It is expected that before proceeding to the next thesis stage, the proponents have demonstrated during the proposal defense that they have understood the thesis project and they know what they will do in the succeeding stage. However, other requirements for this thesis course may be defined by the GDTHES1 instructor. The grade for the GDTHES1 course may be independent of the outcome of a thesis group’s proposal defense.

Once a thesis proposal is submitted, the proponents will undergo a proposal defense to present their topic to a thesis panel committee.

There will be four (4) possible verdicts after the defense:

1. **Conditional pass with revisions/recommendations.** This verdict is given if the thesis panel committee has approved the general objective of the thesis project with some minor revisions, and the students are able to show that they understand the project. Once accepted, **the thesis topic, general objective, specific objectives, and scope and limitations of research** can no longer be changed. The research objectives established at this stage must be accomplished during the THSST-1 stage.

Thesis groups are expected to comply with all the revisions and recommendations stated in the Revisions List and Verdict Form. Failure to do so would result to the change of verdict from **Conditional Pass with Revisions/Recommendations** to **Fail**. Moreover, failure to comply with any requirements and/or deliverable set forth by the Instructor, thesis panel committee and the Thesis Coordinator would result in a failingmark.

1. **Re-presentation of the proposed topic.** This verdict is given if the thesis panel committee has approved the general objective of the thesis project. However, the students need to conduct further study and clarify the proposed topic. This verdict is also given if students are not able to show their understanding of the proposed topic. In this case, the students will undergo another defense/presentation of the same topic. There are four (4) possible verdicts from here: **Conditional Pass with Revisions/Recommendations; Re-presentation of the proposed topic[[1]](#footnote-1); Change topic;** and **Fail**.
2. **Change topic.** This verdict is given if the general objective of the thesis project is unclear and the students are not able to show they understand the project. Specific objectives of their research and as well as its scope are questionable. This verdict is also given if the thesis project is not aligned with the department’s thrust. The group has the option to present**[[2]](#footnote-2)** another thesis proposal or improve their current proposal based on the recommendations given to them by the thesis panel committee. There are four (4) possible verdicts from here: **Conditional Pass with Revisions/Recommendations; Re-presentation of the proposed topic[[3]](#footnote-3); Change topic;** and **Fail**.
3. **Fail.** This verdict is given if the general objective of the thesis project has been rejected. More so, the thesis group, who has initially been given a verdict of **Conditional Pass with Revisions/Recommendations, Re-presentation of the proposed topic** or **Change Topic**, fails to submit the required defense deliverables on or before the deadline set by the Instructor.

The verdict is a unanimous decision among the members of the thesis panel committee. Once issued, it is final and irrevocable. However, in meritorious cases (i.e. after further research, the thesis group has seen some objectives are no longer feasible), thesis groups before proceeding to GDTHES2 are allowed by the department to change the following: specific objectives, scope and limitations of research. In this case, thesis groups are required to submit 4 copies of letter of **Request for Changes** at **least one (1) month** before the first day of the target defense week to the GDTHES1 instructor. The letter is addressed to the GDTHES1 instructor and should contain, but will not be limited to the following:

* Original items stated in the proposal document
* Suggested/Recommended changes in the proposal document
* Justifications and/or reasons for such changes (i.e. lack of time, easier implementation or reducing the scope of research work are not valid excuses)

All copies of the letter should be signed by all members of the thesis group and noted by the group’s adviser. Once the letter is received by the GDTHES1 instructor, he/she will convene with the thesis panel committee in coordination with the group’s thesis adviser, if necessary, to discuss the changes. The thesis group will be notified of the decision through the thesis adviser.

The following table lists down the important activities of GDTHES1 and its corresponding week of defenses and deliverables:

Table 1: Important GDTHES1 Schedule of Activities (Per Trimester)

|  |  |
| --- | --- |
| Submission of Documents for the 1st Defense Week | Class meeting on 10th week |
| 1st Defense | 11th week |
| Submission of Documents for the 2nd Defense Week | Class meeting on 12th week |
| 2nd Defense Week (Re-defense Week) | 13th week |
| Submission of approved thesis proposal document | 14th week |

**Deliverable:** Thesis Proposal Document

## 3.2. GAME DEVELOPMENT Project 2 (GDTHES2)

Entry into the GDTHES2 stage requires a passing mark in GDTHES1 and a successful thesis proposal defense. GDTHES2 involves the following activities:

1. search and review of related literature
2. investigation and evaluation of existing solutions to the identified problem(s)
3. application of methods and theories in the design of a solution to the problem(s)
4. development and implementation of the solution identified in THSST-1;
5. documentation of design and implementation issues;
6. development of major system functions;
7. game testing and analysis of test results;
8. documentation of testing activities and test results;
9. finalization of the thesis deliverables (main document, technical manual, user’s manual, software)
10. preparation for the thesis defense

The following are the deliverables required at the end of this stage:

1. the complete thesis document including appendices
2. for thesis involving software support systems or applications:

* the Technical Manual[[4]](#footnote-4);
* the User’s Manual[[5]](#footnote-5); and
* the running software.

A thesis group is eligible for GDTHES2 defense (final thesis defense) only if the thesis adviser recommends it by signing the Adviser’s Recommendation Sheet or the document’s title page (for all copies). There are four (4) possible verdicts and these are:

* 1. **Conditional pass with revisions/recommendations.** This verdict is given if the following conditions (minimum requirements) are met:
* All objectives are met and satisfied;
* The software is working properly;
* System testing and analysis of test results are sufficient;
* The proponents are able to answer the questions of the thesis panel committee convincingly;
* Sufficient preparation for the defense;
* The thesis main document, technical manual, user’s manual and other required thesis deliverables are well-written; and
* Proponents have a good grasp of the objectives of the thesis and principles and methods.

However, minor revisions are necessary to enhance the document and/or software, but they do not have to be presented again before the thesis panel committee. Consultations with any members of the thesis panel committee are highly encouraged to make sure that all the required revisions are performed before the panel signs the Panel’s Approval Sheet. Thesis groups can receive a failing mark if they fail to comply with any of the requirements expected from them by the thesis panel committee, adviser and the ST Thesis Coordinator.

* 1. **Redefense.** Another formal defense is necessary because the group failed to present their thesis properly and/or the documentation and/or software contain major errors. It is expected that the thesis group is able to resolve any major issues found in their work and that minimal revisions can be found. Only two verdicts are possible after the redefense: **Conditional Pass with Revisions/Recommendations** or **Fail.**
  2. **Redemo.** Presentation of the software/system to the thesis panel committee with minimal revisions on the thesis group’s documentation. Only two verdicts are possible after the Redemo: **Conditional Pass with Revisions/Recommendations** or **Fail**.
  3. **Fail.** Either the objectives of the study have not been met or the group cheated.

The verdict is a unanimous decision among the members of the thesis panel committee. Once issued, it is final and irrevocable.

The following table shows the important activities in GDTHES2 and its corresponding week of defenses and deliverables:

Table 3: Important GDTHES2 Schedule of Activities (Per Trimester)

|  |  |
| --- | --- |
| Submission of thesis documents for regular defense | Class meeting on the 10th week |
| Regular Defense | 11th week |
| Submission of thesis documents for re-defense | Class meeting on the 12th week |
| Re-defense | 13th week |
| Submission of Final Deliverables | 14th week |

**Deliverable:** Thesis Document and/or Requirements stated at the Thesis Manual of Style (GDTHES2)

Table 4 summarizes the guidelines discussed in this section:

Table 4: Thesis stages guidelines

|  |  |  |  |
| --- | --- | --- | --- |
| **STAGE** | **PREREQUISITES** | **DELIVERABLES** | **POSSIBLE VERDICTS** |
| GDTHES1 |  | Thesis Proposal | Accept with Revisions/Recommendations;  Re-Presentation of the Proposed Topic;  Change Topic  Fail  The numeric grade is specified by the GDTHES1 instructor. |
| GDTHES2 | Completion of GDTHES1;  Approved thesis proposal;  Completion of all prerequisite courses as specified in the appropriate GD flowchart | Complete thesis document;  If applicable, running game with the following documents: Technical Manual & User’s Manual  Properly labeled CD containing the thesis documents, game (if applicable), brochure, poster, flash presentation, etc. | Accept with Revisions/Recommendations;  Redefense;  Redemo;  Fail  The numeric grade is given by the GDTHES2 instructor. |

# **4.0 Thesis Manual of Style**

## 

## 4.1 Thesis Proposal Outline and Contents

**Title Page**

If the title of the thesis is an acronym, provide a line description of the said acronym. This one-line description provides the reader a general idea of what the thesis is all about.

Example: ITS-C: An Intelligent Tutoring System for C Programming

**Abstract**

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 thesis itself. It states the rationale and the objectives of the research. Do not put citations or quotes in this section. Avoid beginning the abstract with “***This paper/document/thesis/study/ project/…*”**

The abstract should include **at least five keywords** that are relevant to the thesis project. For example:

**Keywords:** agent, collaboration, communication, multi-agent systems, and distributed artificial intelligence.

For possible keywords and/or classification recommended by the Association of Computing Machinery (ACM) and Institute of Electrical and Electronics Engineers (IEEE), please see the following sites, respectively:

* <http://www.acm.org/class/>;
* <http://code.ucsd.edu/keywords.html>;
* <http://code.ucsd.edu/ieee_keywords>

**Table of Contents**

Observe the following format:

1. Research Description ……………………………………………….………….…1-1
   1. Overview of the Current State of Technology ……………………………….…1-2
   2. Research Objectives………………………………………………….…….……..1-3
      1. General Objective…………..………………………………………………………1-3
      2. Specific Objectives ……………………………………………………………...…1-3

Note that the page number notation is as follows:

<chapter/appendix> – <page number>

Thus the first page of Chapter 2 is **2-1**, while the first page of Appendix A is **A-1**.

1. **Research Description**

<provide a sentence or two describing this section>

* 1. **Overview of the Current State of Technology**

This section gives the reader an overview of the specific game technology or field in the international or local setting. The information regarding the technology or field should be contemporary and not based on outdated sources. Discussion must not be too technical or too detailed.

This section ends with a discussion on the problems faced by or that still exist in the specific technology or field (e.g., limitations of existing game). The problem statement would lead to the research objectives.

**1.2. Research Objectives**

**1.2.1 General Objective**

This section states the overall goal that must be achieved to answer the problem.

**1.2.2 Specific Objectives**

This subsection is an elaboration of the general objective. It states the specific steps that must be undertaken to accomplish the general objective. These objectives must be ***specific, measurable, attainable, realistic, and time-bounded***. Each specific objective may start with “**to design/survey/review/analyze…**”

Studying a particular programming language or development tool (e.g., to study Windows/Object-Oriented/Graphics/C++ programming) to accomplish the general objective is inherent in all thesis and, therefore, must not be included here.

**1.3 Scope and Limitations of the Research**

This section discusses the boundaries (**with respect to the objectives**) of the research and the constraints within which the research will be developed.

**1.4 Significance of the Research**

This section explains why research must be done in this area. It rationalizes the objective of the research with that of the stated problem. Avoid including here sentences such as “This research will be beneficial to the proponents/department/college” as this is already an inherent requirement of all GD thesis projects. Focus on the research’s contribution to the Game Development field.

1. **Review of Related Literature**

This section discusses the features, capabilities, and limitations of existing research, algorithms that are relevant and related/similar to the thesis. The reviewed work and game software must be arranged either in chronological order, or by area (from general to specific). Observe a consistent format when presenting each of the reviewed works. In this section, the maximum number of pages is 20. At the end of this section, a table of summary should be included discussing the different systems discussed so far.

1. **Research Methodology**

This section lists and discusses the specific steps and activities that will be performed by the proponents to accomplish the project. The discussion covers the activities from the proposal to the final thesis stage.

Examples of activities include inquiry, survey, research, brainstorming, canvassing, consultation, review, interviews, observe, experiment, design, test, document, etc. The methodology also includes the following information:

* What will be done
* How it will be done
* When and how long will the activity be done
* Where will it be done
* Why should be activity be done

1. **Calendar of Activities**

This section contains the Gantt chart showing schedule of the activities outlined in the previous section (Research Methodology). The following table is an example of a Gantt chart:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| ACTIVITY | JAN | FEB | MAR | APR | … |
| Data Gathering | **\*\*\*\*** | **\*\*** |  |  |  |
| Game Requirements Analysis |  | **\*\*\*\*** | **\*\*\*\*** | **\*\*\*\*** |  |
| Initial Architectural Design |  |  |  | **\*\*** |  |

**5.0. Bibliography**

**Appendix A. Resource Persons**

For each resource person, specify the following items:

<Full name and title, e.g., Dr. Juan de la Cruz>

<Profession, e.g., faculty>

<Department, e.g., College of Computer Studies>

<Name of institution, e.g., De La Salle University>

<E-mail address>

**Appendix B. Personal Vitae**

For each proponent, specify the following items:

<Full name and title, e.g., Mr. Juan de la Cruz>

<Residence address>

<Contact numbers>

<E-mail address>

Note:

**(a) Font size = 10 pts**

**(b) Font type = Arial**

## 4.2 Thesis Document for Basic Research Outline and Contents

**Title Page**

**Adviser’s Recommendation Sheet**

**Panel’s Approval Sheet**

**Acknowledgement[[6]](#footnote-6)\***

**Abstract**

**Table of Contents**

**List of Tables**

**List of Figures**

1. **Research Description**
   1. Overview of the Current State of Technology (Thesis Proposal section 1.1)
   2. Research Objectives (Thesis Proposal section 1.2)
   3. Scope and Limitations of the Research (Thesis Proposal section 1.3)
   4. Significance of the Research (Thesis Proposal section 1.4)
   5. Research Methodology (Based on Thesis Proposal section 3.0 but modified to reflect what was actually done while developing the project)
2. **Review of Related Literature**

Part of the contents of this section is lifted from Chapter 2 of the Thesis Proposal. Additional materials gathered during the different thesis stages must also be included. It is highly recommended that all existing systems being studied and reviewed are recent. This chapter should contain at most 20 pages, thus the discussion must be clear and concise.

1. **Theoretical Framework**

This section discusses relevant theories and concepts to be used in the course of designing or developing the thesis. Include only those concepts that you feel will be needed. **Do not copy the whole source material**. Use the topics stated in the Thesis Proposal Research Objectives as a guide in determining the contents of this section.

1. **The System Model, Algorithm, and Design**
2. **Analysis**
3. **Conclusion and Recommendations**
4. **Bibliography** (follow the format in the Thesis Proposal)

**Appendix A …**

**Appendix *xxx* …**

**Appendix (xxx)+1 Resource Persons** (follow the format in the Thesis Proposal)

**Appendix (xxx)+2 Personal Vitae** (follow the format in the Thesis Proposal)

**TECHNICAL MANUAL** (if there is a software support system and depends on the nature of the basic research output)\*

**USER’S MANUAL** (if there is a software support system and depends on the nature of the basic research output)\*

## 4.2 Thesis Document for Applied & Application-Based Research Outline and Contents

**Title Page**

**Adviser’s Recommendation Sheet**

**Panel’s Approval Sheet**

**Acknowledgement[[7]](#footnote-7)\***

**Abstract**

**Table of Contents**

**List of Tables**

**List of Figures**

1. **Research Description**
   1. Overview of the Current State of Technology (Thesis Proposal section 1.1)
   2. Research Objectives (Thesis Proposal section 1.2)
   3. Scope and Limitations of the Research (Thesis Proposal section 1.3)
   4. Significance of the Research (Thesis Proposal section 1.4)
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1. **Theoretical Framework**

This section discusses relevant theories and concepts to be used in the course of designing or developing the thesis. Include only those concepts that you feel will be needed. **Do not copy the whole source material**. Use the topics stated in the Thesis Proposal Research Objectives as a guide in determining the contents of this section.

1. **The <XYZ> Game System**

This section gives the overall specifications and functional requirements of the game software to be developed.

* 1. **Game Overview**

This section gives an overall view of the main features and capabilities of the software.

* 1. **Game Objectives**

This section states the specific requirements that must be met by the system.

* 1. **Game Scope and Limitations**

This section discusses the scope and limitations (i.e., the level of capability or extent of power) of each major function listed in section 4.2 above. This means that operations, which are beyond the identified limits, will simply be invalidated/ignored, and will not cause the system to malfunction, but instead cause the system to respond with error messages.

Justifications for the identified limitations and assumptions must be included here. Assumptions are the conditions that must be satisfied or things that must be existing/available/followed in order for the system to function properly. Ignoring such assumptions might result in system malfunction, which will not be the responsibility of the proponents.

* 1. **Architectural Design**

This section presents the initial internal design of the game system, by discussing its major components and their interactions. These components include the game software components (e.g., modules, game designs, storyboards, etc.), as well as the hardware components (e.g., processors, devices, etc.). The components and their interactions are graphically represented using design tools, such as hierarchical charts, structure charts that can help development designs. In addition, discussions on why certain alternative and trade-offs were chosen must be included (e.g., issues on game software decomposition, cost of hardware). Take note that this section can be modified as the thesis group sees fit during the development.

* 1. **Game Functions**

This section provides a listing of all the functions that must be performed or delivered by the game, and a description of each. Screen designs may be included, to help visualize the function being discussed. Usually, the functions are based on the menu and toolbar options. If a function generates reports, the report formats must be included in this section. Take note that this section can be modified as the thesis group sees fit during the development.

* 1. **Physical Environment and Resources**

This section discusses the hardware and game software resources needed to implement and to execute the system. If the system has a special set of target users, this section also includes the user specification (e.g., educational level, experience, and technical expertise). For certain uncommon resources, a discussion of why such resources are necessary must also be included.

1. **Design and Implementation Issues[[8]](#footnote-8)\***

This section discusses the design and implementation of the major structures and designs used in the game software. It included a discussion on the major issues and problems encountered, and the corresponding solutions and alternatives employed by the proponents. Parts of the design tools in the Technical Manual may be lifted as figures in this section.

1. **Results and Observations\***

This section presents the analysis, interpretation and implications of the summarized test results, as well as observations on the limits of the game’s capabilities. It also discusses the type(s) of testing performed on the game, the test data used, and the results of the tests.

The type(s) of tests performed varies depending on the game developed. For instance, commissioned software would require a detailed acceptance test and system response time analysis, while game software implementing an AI algorithm would require an analysis of the performance of the algorithm on different games or on different test data.

1. **Conclusion and Recommendations\***

This chapter gives an assessment of what happened in this project. It presents explanations and justifications on how the objectives of the thesis were met, to what extent and why some objectives were not met.

1. **Bibliography** (follow the format in the Thesis Proposal)

This chapter also includes a discussion of possible improvements that can be made on the game itself, as well as future directions of the research topic in general. This serves as a springboard for projects that may be done by future thesis groups.

**Appendix A …**

**Appendix *xxx* …**

**Appendix (xxx)+1 Resource Persons** (follow the format in the Thesis Proposal)

**Appendix (xxx)+2 Personal Vitae** (follow the format in the Thesis Proposal)

**TECHNICAL MANUAL** \*

**USER’S MANUAL** \*

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\*To be submitted in the final thesis document only.

1. Allowed only if within the schedules defined by the GDTHES1 Instructor [↑](#footnote-ref-1)
2. Allowed only if within the schedules defined by the GDTHES1 Instructor [↑](#footnote-ref-2)
3. Allowed only if within the schedules defined by the GDTHES1 Instructor [↑](#footnote-ref-3)
4. Required if the Adviser sees it applicable [↑](#footnote-ref-4)
5. Required if the Adviser sees it applicable [↑](#footnote-ref-5)
6. \* To be submitted in the final thesis document only. [↑](#footnote-ref-6)
7. \* To be submitted in the final thesis document only. [↑](#footnote-ref-7)
8. \* To be submitted in the final thesis document only. [↑](#footnote-ref-8)