

Guidelines

for the

DT228-3 Individual Level 7 Projects Module

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**Project Co-ordinator:** Susan McKeever

**Room:** K 201

**E-mail:**  [susan.mckeever@dit.ie](mailto:susan.mckeever@dit.ie)

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# Introduction

Every degree student is required to undertake an individual project. The purpose of this project is to evaluate the student’s ability to undertake a significant piece of independent work under the guidance of a Supervisor.

This module requires the student to propose, design, implement, test, document and present a software project to demonstrate the level of knowledge gained over the course of their studies. The project must be an independent piece of work which is both coherent and well structured. The student is expected to be self-motivated so as to drive this work through to completion. They are expected to identify the key areas of the project and to make real decisions that will ultimately affect the end deliverable. The project deliverable will be an assessable, independent body of work that will demonstrate the student’s ability to work on their own and their ability to communicate key aspects of the project.

The aim of the project is to test the student’s ability to *research*, *design*, *implement* and *report* on a software system that they have developed. Subject areas for projects can cover a wide variety of areas. Examples of such areas are: the development of software tools, the development of graphics based systems, the development of mobile applications, the implementation of information systems of sufficient complexity and scope etc. Even though these topics cover different areas, the work involved can be sub-divided into the following five generic stages:

Stage 1: Identify a problem area (i.e. project topic) and main objectives of the project.

Stage 2: Research and/or analyse the project area to gain an understanding of the work involved. At this stage the student should be able to articulate the proposed solution, objectives and scope of the project.

Stage 3: Design a solution.

Stage 4: Implement the solution.

Stage 5: Testing and evaluation.

Each project has the following deliverables:

* The Interim report
* System Software
* The Project Report; This incorporates the Interim Report and documentation relating to work completed during the other stages of the project.

This document presents a set of guidelines developed within the School of Computing for both staff and students involved in the individual projects.

Section 2 describes the stages of the project outlined above in more detail.

Section 3 outlines the project deliverables. It also briefly describes how work will be assessed.

Section 4 describes the roles of the people involved in the project. In particular the role of the student, the Supervisor, the Project Co-ordinator and Project Monitors are clearly outlined.

Section 5 introduces the concepts of *references*, *citations* and *plagiarism*. This is extremely important and should not be overlooked or taken lightly. There is also a link in this section to another essential document which describes these concepts in more detail.

# Stages of the Project

There are five distinct stages associated with the progression of the project as follows:

## Stage 1 - Identify a project topic

Each student is expected to identify their own project topic. Ideas for projects can come from a variety of places including an area where a student has a particular interest or where a student has undertaken work outside or even from family and friends. There may also be some project ideas put forward by members of the School of Computing lecturing staff. A student who is interested in pursuing one of these projects should contact the staff member involved. These projects are allocated at the lecturer’s discretion.

Students who have difficulty identifying a topic should communicate this to the Project Co-ordinator or to a member of the School of Computing staff who will endeavour to assist the student in this regard.

Having identified a possible project each student must complete a **Project Proposal Form** with a brief description of their project idea and submit it to a member of the School of Computing staff for discussion and approval. Once the staff member is satisfied that the project is feasible and appropriate, they will sign the form. The student should then submit the Project Proposal Form to the Project Co-ordinator.

It is the responsibility of the student to ensure that the form is submitted to the Project Co-ordinator. Once the Project Proposal is accepted, the student will be allocated a Supervisor and a Second Reader.

## Stage 2 - Research / Analyse the project topic

During this stage the student is expected to research the project in order to fully understand the domain of the project and any appropriate solutions.

One area to consider is the methodology to be used. There may be a variety of methodologies to choose from depending on the project. The student should consult with their Supervisor on choosing the most appropriate methodology. As a guide to possible approaches to use for research, four categories of projects with appropriate research methodologies are presented below.

### i) Development of a Software Application

These projects involve the automation of an existing manual system, making an existing computerised system more efficient or developing a new and innovative application. An example would include developing a sales and purchasing system for an organisation. At the heart of these projects is a data storage and retrieval component. The complexity and standard of such applications should far exceed that expected for lab assignments undertaken during the course.

The type of research appropriate for such projects would involve

* Carrying out an industry focussed feasibility study.
* Performing a systems analysis on any existing systems and for the final system. This may involve the use of traditional analysis or object-oriented analysis approaches.
* Determining the requirements and objectives and scope of the application.
* Researching and choosing the most appropriate platform and technology for the development and deployment of the final application.
* Outlining a proposed development strategy,

### ii) Development of a Software Tool

These projects generally involve the implementation of a software tools on specific platforms. Examples of such tools include: text editors, file viewers, web browsers and client/server backup systems. The research approach for such projects would normally involve:

* Researching the area for similar tools and solutions.
* Determining the user requirements for the software tool.
* Outlining the objectives and scope of the project.
* Determining the most appropriate platform and technology to be used both for development and deployment of the software tool.
* Outlining the strategy to be employed for developing the software tool.

### Development of a Graphics based system

These projects involve developing graphics based applications (2D) such as a games application e.g. Chess. The research for such projects would involve:

* Researching graphics programming concepts.
* Performing analysis to determine the requirements and scope of the project.
* Determining the most appropriate platform and technology to be used both for development and deployment of the final system.
* Outlining the strategy to be employed for developing the Graphics System.

### iv) Development of a Hybrid System (Systems Integration)

These projects involve the implementation of software applications across multiple platforms. Examples would include an application implemented on a PDA or some other mobile device communicating with a server. The research for such projects would typically involve:

* Researching the communications technologies and development tools appropriate to each platform.
* Determining the user requirements for system.
* Outlining the objectives and scope of the project.
* Deciding on the most appropriate equipment and technology to be used for the development and deployment of the Hybrid System. The use of “plug and play” systems on their own will not be deemed appropriate.
* Outlining the strategy to be employed for developing the hybrid system.
* Defining a deployment strategy for installing and using the system.

Depending on the project, the use of systems analysis methods or techniques may be appropriate.

## Stage 3 - Design a solution for the project

At this stage the student should design a solution for the project. The design method used will vary depending upon the project area but it should be presented in such a way that it is clear to the reader how the project will be implemented. The tools that will be required to implement the project should also be decided upon at this stage.

In general, the design task should produce documents detailing the following:

* The functionality of the proposed system.
* The structure and relationships between the entities/objects in the system.
* A user interface design. A user interface prototype may be appropriate at this stage to validate the user interface with the users.
* A testing strategy detailing the criteria to be used for stage 5 (Testing and Evaluation) of the project.

It will also be necessary at this stage to produce technical *prototypes* to demonstrate the student’s grasp of the chosen technologies and the proposed solution.

## Stage 4 - Implement the solution

This is the implementation stage of the project.

This implementation stage must contain a strong programming element and must follow to a large extent the design developed in Stage 3. Some deviation from the initial design may be acceptable provided it is authorised by the Supervisor and well documented.

## Stage 5 - Testing and evaluation

This stage involves two distinct processes, testing and evaluation. Testing is to check that everything works, whereas evaluation is about the student’s perception of how well the project went and how they perceived their own performance. These processes should be separately identified in the Final Project Report.

For projects that involve the implementation of software the testing phase is often the stage that requires the most careful planning and organisation. Testing is central to any well-developed system and is something that should not be left until the last moment. Testing should be carried out as the product is being developed during the implementation stage. At the end of this testing and evaluation stage, the student should be fully aware of the strengths and weaknesses of their product.

In relation to the evaluation process the student discusses their own performance in relation to the project. In particular the student should discuss:

* Whether the objectives of the project were satisfied, and if not, the reasons why.
* Any weaknesses in the project or weaknesses in how they approached the project. The student should indicate how they would do things differently if they were starting the project again.
* The successes of the project comparing it to other equivalent systems they may have encountered during the course of the project.

The use of third party evaluation techniques such as Nielsen's Heuristics might form part of this evaluation process.

It is important that the student has previously discussed and agreed a testing strategy with their Supervisor during Stage 3 of the project and that these are included in the Final Project Report.

# Project Deliverables

The key dates for the project deliverables are clearly set-out by the Project Co-ordinator.. Students must keep track of these dates as they may change during the project. Late submissions will not be accepted.

## Project Proposal

Ideas for projects can come from a student’s particular interest in an area, from outside work undertaken by students, or many other sources. There will also be project topics suggested by staff or external companies available on the Project Co-ordinator’s website. Students who have difficulty identifying a topic should communicate this to the Project Co-ordinator or any member of the School of Computing staff who will assist them in choosing an area.

Having identified a possible project each student must complete a Project Proposal Form which should include a brief description of the project together with the aims and objectives of the project. The student must then submit this form to a member of the School of Computing staff for discussion and approval. Once the staff member is satisfied that the project is feasible and appropriate, they will sign the form. The student should then submit the Project Proposal Form to the Project Co-ordinator. It is the responsibility of the student to ensure that the form is given to the Project Co-ordinator by the due date. Once the Project Proposal is accepted, the student is allocated a Supervisor and a Second Reader.

## The Interim Report

This deliverable includes all of the work produced as a result of Stages 1, 2 and 3. **It contributes to 10% of the final project mark.** It is in the form of a written report submitted to the Supervisor and Second Reader[[1]](#footnote-1). It is envisaged that the interim report will form a basis for a number of chapters in the Final Project Report.

## The Final Project Report

A key deliverable from the project is the Final Project report. It tests the student’s ability to clearly document the work involved in completing the project. Essentially it is the student’s record of the work they have undertaken during the year and serves as a guide to how well the student understands the project area.

Each project is assessed by a number of people including the Project Supervisor, Second Reader, a Project Monitor and an external examiner. As the Supervisor meets with the student most regularly throughout project it is imperative that the various stages of the manual are presented to the Supervisor on a regular basis for his/her comment. The objective is to ensure that the manual is as detailed and clear as possible for the benefit of the other examiners.

As stated previously the Interim Report will form the basis of a number of chapters in the final project report so it is important to ensure that this Interim Report is detailed and clear. It is also advisable to continue to write-up the manual during the implementation stage. Do not leave the write-up until the last few weeks of the project.

## The Project Demonstration

Towards the end of the project the student is required to make a Project Demonstration. This will involve a short presentation (with appropriate slides) based on the project report and a full demonstration of the final software/system. The Supervisor, Second Reader and Project Monitors will attend the Project Demonstrations and will ask appropriate questions of the student to test their knowledge and understanding. Guidelines for the Project Demonstration will be provided at the appropriate time.

## Assessment of Work

The final completed project is assessed under a number of categories as follows:

* Research and Background Knowledge - the extent of the student’s background research. Their knowledge and understanding of current work of the project area and quality of references
* Design Quality and Methodology - the quality of the design of the project and methodological approach.
* Quality of the Outcome – this includes the quality of any implementation and/or research findings.
* Completeness and Complexity - some projects are by their nature more complex than others. This category reflects how complete a particular project is with respect to the overall complexity of the project.
* Project Management - the conduct of the student during the project, including project management skills and effort, pro-activeness and initiative
* Presentation – the quality of the student’s project demonstration and ability to enter into an intelligent discourse about their project area and defend their approach to the project. The student’s level of critical thinking is paramount for a successful presentation.
* Composition/Organisation of Dissertation – in terms of the structure, clarity, spelling and grammar i.e. the “technical” aspects of the dissertation.
* Critical Analysis and Independent Thought – the student’s ability to critically evaluate their own and others work. Their ability to justify their choices. Their capacity to identify the strengths and weaknesses of the final project and suggest alternative approaches and future work

# Roles of the Individuals Involved

## The Role of the Supervisor

The role of the Supervisor is to *advise* the student through each stage of the project and to *assess* the student’s work in consultation with other examiners. The Supervisor should meet the student once a week at an agreed time that suits both Supervisor and student. It is important to remember that the Supervisor is *not* there to do the work for the student but to guide and assess the work as it is completed. The Supervisor also gives technical assistance to the student as required. The Supervisor should encourage initiative in the student so that the student learns to take responsibility for their own work and does not become overly dependent upon the Supervisor.

At the start of the project, the Supervisor will assist the student in working out a time-scale for the various stages of the project; this should be regularly updated as the project continues. The Supervisor should continue to guide the student though *each* stage of the project and should advise the student on any difficulties he/she may experience. The Supervisor should also regularly update the student on their performance. If a Supervisor is worried about the performance of a student, this should be communicated to the Project Co-ordinator so that corrective action can be taken.

## The Role of the Student

The project gives the student the opportunity to apply the skills they have acquired on the course. The ultimate responsibility for the completion of the project lies with the student and the project should be entirely the student’s own work. This means that students are expected to develop strategies for completing their project and for addressing any problems that may arise in their project. The student should consult with the Supervisor to develop their ideas and should not depend upon the Supervisor to actively sort out problems. Project meetings should consist of an exchange of views by student and Supervisor and should not just involve the Supervisor telling the student what to do and how to do it.

Both the student and the Supervisor should engage with each other in a courteous, considerate and professional manner. For instance if either party cannot attend a pre-arranged meeting, this should be communicated to other party in advance.

## The Role of the Project Co-ordinator

The role of the Project Co-ordinator is to oversee the management and administration of the projects as a whole. Any queries or problems experienced by either staff or students should be communicated to the Project Co-ordinator.

## The Role of the Project Monitors

The role of Project Monitor is to ensure consistency in the marks allocated across all projects by examiners. In order to achieve this, a Project Monitor attends each project demonstration.

## The Role of the Second Readers

The role of the Second Reader is to act as a second internal examiner to a project.

# Referencing

The Final Project Report like any other scientific work will contain thoughts and ideas from other peoples work or material. This is not unusual or wrong provided that appropriate credit is given to the other person or people. This is achieved through the use of *references* and *citations*.

A *reference* is information that allows the *source* of other peoples work or material to be identified by the reader (in order that he/she can ‘follow’ the reference to the source). References appear in the bibliography in a list form.

A *citation* is the short ‘tag’ that appears after a word, statement, or paragraph in the text of the Final Project Report. It indicates that the word, statement, or paragraph is based upon, or derived from material from another *source*. The citation allows the reader to identify the correct reference to use to track back to the original source.

Citations and referencing allows the reader to differentiate between the student’s own work and that of others. Failure to correctly use citations and references may lead to accusations of *plagiarism*; something which the Institute takes very seriously. If plagiarism is suspected, an investigation will be instigated. If *plagiarism* is confirmed severe penalties may be applied including (but not limited to) a student receiving zero marks for their project and/or a student asked to repeat the module or ultimately it may lead to the student being expelled from the Institute temporarily or permanently.

Consequently, careful consideration should be given to references and citations when embarking upon writing the Final Project Report. Refer to document titled “Referencing Guidelines for DT228 Project Modules” from the main page.

# Appendix A

## A1 Format of the Final Project Report

The Final Project Report should not exceed 20,000 words **excluding** appendices and bibliography. The Final Project Report should be developed in consultation with the Supervisor and should adhere to the following basic layout:

1. **Title page** – This page contains the title of the project, student name, the course title and code, the academic year in which the project is completed and the Supervisor’s name. [Click here for an example of a title page layout.](file:///C:\Users\susan.mckeever\AppData\Local\Temp\DT2113ProjectGuidelines.doc)
2. **Abstract** - This is approximately a half page summary of the project. It should outline the technical aspects of the project and also identify the individual characteristics of the project. It should provide a clear and concise statement of what the project is about, its goals and the important findings and outcome of the project.
3. **Acknowledgements** – Identify and acknowledge anybody that provided input into the project.
4. **Table of Contents** – Provides a list of all the sections, tables and figures. All pages up to and including the table of contents should be numbered using lowercase roman numerals, whilst all subsequent pages should be numbered normally.
5. **Introduction** – This chapter provides a clear description of the aims and objectives of the project. The case for the project should be argued. In addition it should introduce the structure of the remainder of the Final Project Report.
6. **Chapters 2 to N-2** – The content and sequence of additional chapters will vary depending upon the nature of the project and should be agreed with the Supervisor. Generally, the second chapter will be a Research/Analysis Chapter which should include sections on User/System Requirements, an analysis of similar techniques/systems that have been developed and an analysis of the technologies available at the very least. (Note that only information relevant to the project should be included. An example of what *not* to include would be a chapter on the history of the Java programming language just because Java is used for part of the development). Other essential chapters include: a Design chapter detailing the design of the proposed system, an Implementation chapter detailing how the system was implemented and any issues encountered. [Click here for more guidelines on the structure of a chapter.](file:///C:\Users\susan.mckeever\AppData\Local\Temp\DT2113ProjectGuidelines.doc)
7. **Chapter N-1, Results and Evaluation** – This chapter is one of the most important chapters in the Final Project Report. It is mainly through this chapter that the student demonstrates an ability to evaluate their own work. Here the student should discuss whether the objectives of the project were satisfied, and if not, the reasons why. It is good scientific practice to document any weaknesses associated with the project in an objective and critical manner. Having identified the weaknesses the student should also identify any future work that could be embarked upon to overcome them. The successes of the project should also be discussed, comparing it to equivalent works.
8. **Chapter N, Conclusions and Future Work** – This chapter presents a summary of what was achieved. It details the original objectives of the project, the results (previous chapter), future work etc.
9. **Bibliography** – This should contain a list of references that were cited throughout the Final Project Report.

**Appendices** – This portion of the Final Project Report should contain any supplementary material that whilst not essential for the main body of the Project Manual, may provide extra information for the reader. One appendix should contain a listing of the code developed with appropriate comments and citations. Other appendices may include a brief explanation of technologies, protocols or standards.

## A2 Guidelines on the structure of a chapter [(Return)](file:///C:\Users\susan.mckeever\AppData\Local\Temp\DT2113ProjectGuidelines.doc)

Each chapter should have a number, a title header and a number of sections (and optional sub-sections). Each section/subsection should also have a number and a title header. The chapter should begin with an introduction, a short paragraph that briefly describes the aim and content of the chapter. The chapter should end with a conclusion paragraph that briefly summarises the chapter and introduces the next chapter. The chapter and section headings should use a consistent font style and size. The following is an example of a sample chapter structure:

**Chapter 3 – Design of System**

* 1. **Introduction**

This chapter describes the design of the DIT Exam Processing system. This design chapter is divided into two main sections. The first section describes *etc.*

**3.2 Overview of Design**

*Section content*

**3.3 Detailed Design**

*Section content*

**3.4 Conclusion**

This chapter described the design of the DIT Exam processing system. As has been seen in this chapter, the system will be implemented as a client/server information system. The next chapter describes the implementation of this system.

## A3 Sample Title Page [(Return)](file:///C:\Users\susan.mckeever\AppData\Local\Temp\DT2113ProjectGuidelines.doc)

The cover page of the manual should contain the following information:

Dublin Institute of Technology

Kevin Street

Dublin 8

School of Computing

**Project Title**

**Student Name**

2012 - 2013

Dissertation submitted in partial fulfilment of examination requirements for a BSc in Computer Science (Ordinary)

I declare that all material contained within this dissertation is entirely my own work unless otherwise stated.

Signed: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Supervisor: *name*

1. Refer to the Project Coordinator’s web site or webcourses module for a list of the key milestone dates. [↑](#footnote-ref-1)