Operational Plan

Project Module

BSc (Hons) in Computing
BSc (Hons) in Business Information Systems
BSc (Hons) in Technology Management
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1. Introduction

This document describes the procedures, supports and grading rubrics for the project module. In addition, the document contains supplemental supports to help the students such as a best practise guide.

2. Operational Plan

Overview

The Project Module is held over two semesters, however Semester 2 is for 10 weeks and the exams for the students other Modules are in April. The Project is finally completed in May.

a) Project Pitch

i. Students will undergo a Dragons Den type scenario where they will give a 5 Minute pitch on their proposed project. This may be accepted, accepted with revisions or rejected.

ii. A list outlining other project proposals by staff will then be circulated after the pitch for Students whose original proposal was rejected.

iii. Students are encouraged to come up with their own original ideas for projects and not rely on the projects that will be supplied by the College.

b) Supervisors

i. Once the project has been accepted the students will be assigned a supervisor.

ii. The students are expected to meet with their supervisors on a regular basis. The supervisor has a discretionary 5% that can be awarded to students who have maintained a high level of interactivity.

iii. This is backed up by a reflective journal that is completed each month by students documenting their progress.
c) **Mid-Point Presentation**

i. The Mid-Point Presentation takes place at the end of Semester 1.

ii. This is provided to ensure the students receives good guidance and feedback at this stage.

iii. Students present to their Supervisor and an independent Lecturer

iv. This is a formal assessment and is worth 25% of the overall Project marks.

d) **Final Presentation**

i. The Final Presentation takes place at the end of Semester 2.

ii. Students present to their Supervisor and an independent Lecturer

iii. This is a formal assessment and is worth 70% of the overall Project marks.

iv. **Reflective Journals**

   a. These are monthly reports that are submitted by the students.

   b. These should be used as the Supervisor meeting agenda’s

   c. These Journals are used to assist in awarding the 5% Marks for Supervisor Interaction which is inclusive in the 70%

e) **Showcase**

i. This is a College event where students present to employers and the general public

ii. This event is worth 5% of the overall Project marks.
## 3. Deliverable Plan

<table>
<thead>
<tr>
<th>Deliverables</th>
<th>Description</th>
<th>Due Date</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Pitch</td>
<td>Dragons Den scenario where all students give a 5 Minute Pitch their Project to a panel of 3 lecturers.</td>
<td>Week 4 Semester 1</td>
<td>This process was implemented in order to find weak projects before they have even started. This is Mandatory as all Projects have to be passed by a panel of Lecturers.</td>
</tr>
<tr>
<td>Appendix 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project Proposal</td>
<td>A detailed Project Proposal submission</td>
<td>Week 6 Semester 1</td>
<td>This is a detailed account of the project that was successful during the pitch stage.</td>
</tr>
<tr>
<td>Appendix 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project Requirements</td>
<td>A detailed document outlining the complete requirements for the Project</td>
<td>Week 9 Semester 1</td>
<td>This is a fully fleshed out Requirements Document containing all research and Use cases etc.</td>
</tr>
<tr>
<td>Appendix 3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mid-Point Presentation Marking Rubrics</td>
<td>This consists of a 30 minute presentation of the project to their supervisor and an independent lecturer.</td>
<td>Week 12/13 Semester 1</td>
<td>This is where the students submit their technical report and present their work to date. This is a formal exam and is worth 25%</td>
</tr>
<tr>
<td>Appendix 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Showcase Profiles</td>
<td>This is where students submit a short and large profile on their project</td>
<td>Week 6 Semester 2</td>
<td>These profiles are inserted into a College Booklet complete with pictures of the students and is circulated to employers before the Showcase event that occurs in the last week of May.</td>
</tr>
<tr>
<td>Appendix 5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Final Project Submission Materials</td>
<td>Students upload their final presentation and the Showcase Poster</td>
<td>2nd Week in May</td>
<td>2 bound hard copies of the Technical Report and the Poster.</td>
</tr>
<tr>
<td>Appendix 6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Final Presentation Marking Rubrics</td>
<td>This is where students give a 60 minute presentation on their completed project to their supervisor and an independent lecturer.</td>
<td>3rd Week in May</td>
<td>Students present to a panel of lecturers. This is a formal exam and is worth 70%</td>
</tr>
<tr>
<td>Appendix 7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Showcase Marking Scheme</td>
<td>This is where students showcase their projects to employers and the general public</td>
<td>Last week in May</td>
<td>Students present to the public. This is worth 5%</td>
</tr>
<tr>
<td>Appendix 8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reflective Journals</td>
<td>A Reflective Journal shall be completed on a monthly basis and will involve regular meetings with the supervisor.</td>
<td>Every Month for both Semester 1 &amp; 2</td>
<td>These Journals are used to assist in awarding the 5% Marks for Supervisor Interaction</td>
</tr>
</tbody>
</table>
4. Assessment Details

This table shows how the marks are allocated. It is important to note that there are two formal examinations (Mid-Point & Final Presentation). Detailed grading rubrics are available in Appendix 4.

### BSc (Hons) in Computing & Business Information Systems

#### Mid Point Marking Scheme (25%)

<table>
<thead>
<tr>
<th>Mark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Proposal (20%)</td>
</tr>
<tr>
<td>Project Requirements (40%)</td>
</tr>
<tr>
<td>Project Analysis &amp; Design (8%)</td>
</tr>
<tr>
<td>Prototype (20%)</td>
</tr>
<tr>
<td>Presentation (12%)</td>
</tr>
<tr>
<td>Total (out of 100%)</td>
</tr>
</tbody>
</table>

This 100 marks equates to 25% of the Full Project -
## BSc (Hons) in Computing & Business Information Systems

### Final Presentation Marking Scheme (70%)

<table>
<thead>
<tr>
<th>Component</th>
<th>Mark</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Artefact Development (65%)</strong></td>
<td></td>
</tr>
<tr>
<td>Difficulty (15%)</td>
<td></td>
</tr>
<tr>
<td>Innovation (10%)</td>
<td></td>
</tr>
<tr>
<td>Completeness (10%)</td>
<td></td>
</tr>
<tr>
<td>Implementation (30%)</td>
<td></td>
</tr>
<tr>
<td>Testing (10%)</td>
<td></td>
</tr>
<tr>
<td><strong>Communication Skills (25%)</strong></td>
<td></td>
</tr>
<tr>
<td>Technical Report and/or User Manual (10%)</td>
<td></td>
</tr>
<tr>
<td>Supervisor Interaction (5%)</td>
<td></td>
</tr>
<tr>
<td>Presentation (10%)</td>
<td></td>
</tr>
<tr>
<td><strong>Total (out of 100 Marks)</strong></td>
<td></td>
</tr>
</tbody>
</table>

This 100 Marks equates to 70% of the full Project
### BSHTM4 Mark Sheet Mid-Point Presentation (BA)

#### Mid Point Marking Scheme (25%)

<table>
<thead>
<tr>
<th>Project Deliverables</th>
<th>Mark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Proposal (20%)</td>
<td></td>
</tr>
<tr>
<td>Preliminary Requirements Elicitation (30%)</td>
<td></td>
</tr>
<tr>
<td>Preliminary Requirements Analysis (20%)</td>
<td></td>
</tr>
<tr>
<td>Supporting Technology (10%)</td>
<td></td>
</tr>
<tr>
<td>Communication (20%)</td>
<td></td>
</tr>
<tr>
<td>Total (out of 100%)</td>
<td></td>
</tr>
</tbody>
</table>

### BSHTM4 Mark Sheet Mid-Point Presentation (DA)

#### Mid Point Marking Scheme (25%)

<table>
<thead>
<tr>
<th>Project Deliverables</th>
<th>Mark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Proposal (20%)</td>
<td></td>
</tr>
<tr>
<td>Requirements Elicitation &amp; Analysis (40%)</td>
<td></td>
</tr>
<tr>
<td>High Level Analysis (8%)</td>
<td></td>
</tr>
<tr>
<td>Prototype (12%)</td>
<td></td>
</tr>
<tr>
<td>Communication (20%)</td>
<td></td>
</tr>
<tr>
<td>Total (out of 100%)</td>
<td></td>
</tr>
</tbody>
</table>
### BSHTM4 Mark Sheet Final Presentation (BA)

**Final Presentation Marking Scheme (70%)**

<table>
<thead>
<tr>
<th>Project Deliverables</th>
<th>Mark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication (10%)</td>
<td></td>
</tr>
<tr>
<td>Writing &amp; Presentation of Results (35%)</td>
<td></td>
</tr>
<tr>
<td>Difficulty / Data Analysis Skills (15%)</td>
<td></td>
</tr>
<tr>
<td>Innovation (10%)</td>
<td></td>
</tr>
<tr>
<td>Supporting Technology (10%)</td>
<td></td>
</tr>
<tr>
<td>Completeness (10%)</td>
<td></td>
</tr>
<tr>
<td>Testing/Evaluation (10%)</td>
<td></td>
</tr>
<tr>
<td><strong>Total (out of 100%)</strong></td>
<td></td>
</tr>
</tbody>
</table>

### BSHTM4 Mark Sheet Final Presentation (DA)

**Final Presentation Marking Scheme (70%)**

<table>
<thead>
<tr>
<th>Project Deliverables</th>
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<tr>
<td>Testing/Evaluation (10%)</td>
<td></td>
</tr>
<tr>
<td><strong>Total (out of 100%)</strong></td>
<td></td>
</tr>
</tbody>
</table>
5. Repeating Strategy

There are various reasons why students may have to re-sit parts of this process:

a) Repeat due to failing the project (Receiving less than 40% overall)
   - The strategy here is the student will repeat in the August session and the Project is marked out of 100% (If Mid-Point was not completed otherwise it will be marked out of 70% + 5% for Ad-Hoc Showcase in front of a number of lecturers)
   - The student has the right to continue with the same project idea or undertake a completely new idea.

b) Deferring (Students may defer the project in various ways)
   - Defer the Year
     - Continue next year as per process
   - Defer the year prior to the Mid-Point
     - The strategy here is the student will repeat in the August session as a first sitting and the Project is marked out of 95% (Ad-Hoc Showcase arranged for 5% with a number of lecturers)
   - Defer the Final Presentation in May (assuming Mid-Point complete)
     - The strategy here is the student will repeat in the August session as a first sitting and the Project is marked out of 70% (Ad-Hoc Showcase arranged for 5% with a number of lecturers)

c) Extensions granted due to mitigating circumstances
   - Mid-Point Extension
     - Resit within 2 weeks of original date (Not counting Xmas break days)
   - Final Presentation Extension
     - Resit within 2 weeks of original date
6. Feedback Strategy

The feedback strategy to be adopted is as follows:

A detailed feedback session for all students that fail in the May Presentations will be arranged at the same time as the Exams feedback sessions.

The feedback will be given by the Supervisor:

- List at least 4 major areas why the project failed.
- The Student should be clear as to exactly what is required of this Project to bring it up to a Pass mark.
- These areas to be documented and delivered to the Project Coordinator.
7. Seminars, Online Content and self-directed learning

A number of seminars and tutorials, both in class as well as self-directed online (Pluralsight) are available to guide students through the project. These include

- Research methods
- Writing Project Proposals
- Technical Writing Seminar
- Requirements engineering and writing requirement specifications
- Use Case Modelling
- Analysis & Design
- Frameworks
- Connecting to Databases
- Presentation Skills Seminar
- Software Testing (Inc. Unit & Usability)
8. Examples of a sample of Seminars Contents

a) Research Methods

i. The self-directed learning will give you the skills to:

1. Conduct a literature review
2. Conduct interviews
3. Create questionnaires
4. Referencing
5. Technical/Scientific writing
6. Evaluation
7. Data pre-processing
8. Statistical analysis

b) Requirements Specifications

i. Support for students is available as online content on the Learning Management System and includes the following:

1. IEEE Recommended Practice for Software Requirements Specifications
2. Requirement Specification Template
3. Presentations on using structured English, decision tables and decision trees for documenting requirements
4. Online module on Use Case Modelling for document requirements.

c) Software Development

i. The self-directed learning will review:

1. A generic process model
2. Process assessment and improvement
3. Waterfall model
4. Incremental model
5. Evolutionary model
6. Concurrent model
7. Specialised process models (Component-based
development, formal methods model, aspect-oriented
model)

8. Unified Process

9. Personal and team process models

10. Process technology

11. Product and Process

d) Agile Development

i. The self-directed learning will review:

1. What is agility

2. Agility and cost of change

3. Agile Process

4. Extreme Programming

5. Adaptive Software Development

6. Scrum

7. Dynamic Systems Development Method

8. Crystal

9. Feature Driven Development

10. Lean Software Development

11. Agile Modelling

12. Agile Unified Process

13. A tool set for agile process

e) Database Connectivity

i. The self-directed learning will review:

1. This seminar will take you through how to connect to a database
   from a software application.
f) Software Testing

i. This self-directed learning will review

1. A strategic approach to software testing
2. Strategic issues
3. Unit testing
4. Integration testing
5. Testing strategies for object-oriented software
6. Test strategies for WebApps
7. Validation testing
8. System testing
9. Debugging
10. Internal and external views of testing
11. White-box testing
12. Basis Path testing
13. Control structure testing
14. Black-box testing
15. Model-based testing
16. Testing GUI’s
17. Testing Client-Server Architectures
18. Testing Documentation and Help Facilities
19. Testing real-time systems
20. Patterns for Software testing
21. Testing Object Oriented Systems
22. Testing concepts for web applications
23. Content testing
24. User Interface testing
25. Component–level testing
26. Security testing
27. Performance testing
9. Invention Disclosure Form

Learners are required to complete the Invention Disclosure Form. This form is designed to encourage learners to explore the commercial potential of their project in more detail. At this point students do not and are not required to hand over any Intellectual Property that may be associated with the project to the College. On completion of the project, students are free to add their signature to the form and formally submit it to the Technology Transfer Office for consideration.

The form is shown in Appendix 7: Invention Disclosure Form


A best practises guide that combines the feedback from the individual examiners on common or recurring factors which they identified as contributing to the success or otherwise of projects is described in Appendix 9: Best Practices Guide.

11. Commercialisation Plan

a) Rationale

Some of the final project will have the potential to be commercialised afterwards. The commercialisation plan is designed to encourage students to actively explore the commercial potential of their idea. Through its Technology Transfer Office, the College offers a number of support mechanisms and access to funding for promising ideas and prototypes.

i. Preliminary Commercialisation Plan

a. In the initial phase of the project, students will submit a preliminary commercialisation plan. The plan will answer the following questions:

b. Description of Invention. Please highlight the novelty/patentable aspect. Attach extra sheets if necessary including diagrams where appropriate).

c. What is novel, the ‘inventive step’? For more information on patents, please look at http://www.patentsoffice.ie/en/patents.aspx
d. Why is this invention more advantageous than present technology?

e. What is its novel or unusual features?

f. What problems does it solve?

g. What are the problems associated with these technologies, products or processes?

h. Explain how this invention overcomes these problems (i.e. what are its advantages).

i. List the names of companies which you think would be interested in using, developing or marketing this invention

j. Was there transfer of any materials/information to or from other institutions regarding this invention?

k. Have any third parties any rights to this invention?

ii. A template is shown in Appendix 8 : Preliminary Commercialisation Plan
APPENDICES SECTION
Appendix 1: Project Proposal Pitch

Vetting Process for Final Year Projects (BSHC)

Overview

The primary objective is to integrate a FYP proposal vetting committee step into the overall FYP process. Therein each student, who has chosen to propose their own project idea, would have to give an elevator pitch for their project idea to a committee of a minimum 3 academic staff members. The staff members could then accept or veto the project proposal idea. Acceptance would require an affirmative response from at least 2 of the committee members.

It is envisaged that a student's project would be vetoed primarily on the grounds that it lacks sufficient scope for complexity as to be unsuitable for a capstone BSc. project.

An example of such an unacceptable project would be a simple CRUD pattern applied to some area of the students liking. In the past such projects have arrived on the desk of the academic supervisor after the student has written the proposal and settled on the project, typically this seems to happen up to and after the mid-point.

As a compliment to this there will be a significant amount of staff generated project ideas which would be given to students whose ideas are deemed to be inadequate. Staff ideas will be described in a one-line project title to be extended in consultation with the student, or be fleshed out into a set of deliverable stages (mandatory, discretionary, and exceptional). This list will be held back from the students until after the vetting sessions. 2-3 project ideas will be posted to Moodle in advance of the session to give an idea of how to succinctly describe a project idea of reasonable scope.

This format for FYP projects is based on formats currently being used in UCD and DCU.
The Process

The process will work as follows:

1. This presentation is a Formal Examination and as such attendance is Mandatory.

2. Any students failing to attend must follow the process to submit a re-run request through NCI360.

3. Any Student who fails to produce the evidence for missing will not be allowed progress to the Mid-Point Presentation Stage.

4. Students will present their proposal before the 4th Week of the Semester
   i. Students will submit a 3 slide (pptx) regarding their proposal (This is to allow Lecturers see all the proposals and not just the ones they are examining)

5. This presentation will be informal without the use of props of any kind (for example, no PowerPoint slides can be used on the day) and should cover the following:
   (i) What will the project do?
   (ii) Why is it challenging?
   (iii) Who is the project for?
   (iv) Why should this Project be attempted?
   (v) How is it different than what has been done in this area before i.e. the student must do some preliminary research to ensure there is not an obvious example of the exact same idea?

6. This presentation to be no longer than 5 minutes per student
7. This presentation to be examined by 3 Lecturers
8. One of these Lecturers will act as the Chairperson and will be responsible for documenting the results (A template will be provided)
9. Proposal is either:
   i. Accepted – then carry on
   ii. Amended & Accepted – If the student’s idea is good but their pitch missed a few vital areas
   iii. Vetoed – Student then offered the opportunity to choose from the designated list of Projects as submitted by the Lecturers (see example below).
   iv. If student fails to pick a Proposal then one will be allocated to them.
10. Lecturers may at this point volunteer to supervise this Project. (This does not mean they will actually get it as they will all be reviewed later and assigned appropriately.)
Within the first three months of working on the project, the student should engage with their supervisor to identify the Mandatory, Discretionary, and Exceptional goals for their project.

Broadly we define the above terms as follows:

**Mandatory:** What is the Minimal Viable Product? What do I need to do so I have an App?

**Discretionary:** what are the most obvious extensions to my project in the Codebase, use of different technologies, improved UI etc.

**Exceptional:** What would be truly exceptional? Polished, finished, refined etc.

This should help in defining a sufficient amount of concrete requirements for the Mid-Point presentation before commencing the build part of the project in Semester two.

**Project List**

Every SOC Faculty Member to submit Project Proposals on topics in their areas of interest

**Example of a SOC Faculty Proposal**

**Areas of Interest:** Machine Learning, Parsing, Usability

**Proposer:** Lecturers Name

**Title:** Automatic Temporal Updates in Articles

**Proposal:** News articles will often refer to “last week” or “today”, or some more complicated variant reference to prior, current, or future, events. This project would automatically update annotated temporal references with the time the reader is viewing the article, for example if the event occurred 1 week ago an article written 2 weeks prior would be updated to reflect the passage of time and the fact that the event covered has happened already. This will increase the readability and give quick indications as to the relevance of the article.
Appendix 2: Project Proposal Template

Project Proposal

TITLE

Student Name, Number, email address

Degree Programme Name e.g. BSc (Hons) in Computing

Specialisation (if applicable, e.g., Software Systems, Cloud Computing, Gaming and Multimedia, Networking and Mobile Technologies)

Date

1. Objectives
(Max. 1 Page)

2. Background
(Max. 2 Pages)

3. Technical Approach
Brief description of the approach to be followed (Max. 1 Page), Research, literature review, requirements capture, implementation etc...

4. Special resources required
If applicable, e.g., books, hardware, etc.

5. Project Plan
Gantt chart using Microsoft Project with details on implementation steps and timelines

6. Technical Details
Implementation language and principal libraries

7. Evaluation
Describe how you will evaluate the system with real technical data using system tests, integration tests etc. In addition, where possible describe how you will evaluate the system with an end user.

8. Consultation with Project Specialisation Coordinator
Names of academic staff member consulted and a summary of their feedback
Appendix 3: Project Requirements Template

Introduction

Purpose
The purpose of this document is to set out the requirements for the development of .............
The intended customers are ..........

Project Scope
The scope of the project is to develop a ............. The system shall have a .............

John Smyth was involved in discussions with John Ryan from AN Company Ltd. To elicit the following requirements

This section also details any constraints that were placed upon the requirements elicitation process, such as schedules, costs, or the software engineering environment used to develop requirements.

Definitions, Acronyms, and Abbreviations
AD An other Definition

User Requirements Definition

This section describes the set of objectives and requirements for the system from the customer’s perspective. What are the clients saying they want?

Requirements Specification

All requirements should be verifiable. For example, experienced controllers shall be able to use all the system functions after a total of two hours training. After this training, the average number of errors made by experienced users shall not exceed two per day.

Functional requirements
This section lists the functional requirements in ranked order. Functional requirements describe the possible effects of a software system, in other words, what the system must accomplish. Other kinds of requirements (such as interface requirements, performance requirements, or reliability requirements) describe how the system accomplishes its functional requirements. Each functional requirement should be specified in a format similar to the following:

Short, imperative sentence stating highest ranked functional requirement.
Use Case Diagram
Each requirement should be uniquely identified with a sequence number or a meaningful tag of some kind.

The Use Case Diagram provides an overview of all functional requirements.

Requirement 1 <name of requirement in a few words>
The heading of this section should read, e.g., “Requirement 1: User registration” or “Requirements 1: Participant takes test”

Description & Priority
A description of the requirement and its priority. Describes how essential this requirement is to the overall system.

Use Case
Each requirement should be uniquely identified with a sequence number or a meaningful tag of some kind.

Scope
The scope of this use case is to .......

Description
This use case describes the ...........

Use Case Diagram
Diagram should highlight actors and uses cases........

Flow Description

Precondition
The system is in initialisation mode........

Activation
This use case starts when an <Actor>...........

Main flow
1. The system identifies the ............
2. The <Actor> ...............(See A1)
3. The system ...............(See E1)
4. The <Actor> .............

Alternate flow

A1 : <title of A1>
1. The system ............... 
2. The <Actor> .............
3. The use case continues at position 3 of the main flow
Exceptional flow

E1: <title of E1>
   4. The system ............
   5. The <Actor> ...........
   6. The use case continues at position 4 of the main flow

Termination

The system presents the next ..........

Post condition

The system goes into a wait state

Requirement 2 <name of requirement in a few words>

Description & Priority

A description of the requirement and its priority. Describes how essential this requirement is to the overall system.

Use Case

Each requirement should be uniquely identified with a sequence number or a meaningful tag of some kind.

Scope

The scope of this use case is to .......

Description

This use case describes the ...........

Use Case Diagram

Diagram should highlight actors and uses cases........

Flow Description

Precondition

The system is in initialisation mode........

Activation

This use case starts when an <Actor>..........
Alternate flow

A1 : <title of A1>
7. The system ............... 
8. The <Actor> ............... 
9. The use case continues at position 3 of the main flow

Exceptional flow

E1 : <title of E1>
10. The system ............... 
11. The <Actor> ............... 
12. The use case continues at position 4 of the main flow

Termination

The system presents the next ...........

Post condition

The system goes into a wait state

List further functional requirements here, using the same structure as for Requirements 1 & 2. Most systems would have at least five main functional requirements.

Non-Functional Requirements

Specifies any other particular non-functional attributes required by the system. Examples are provided below. Remove the requirement headings that are not appropriate to your project.
Performance/Response time requirement
Availability requirement
Recover requirement
Robustness requirement
Security requirement
Reliability requirement
Maintainability requirement
Portability requirement
Extendibility requirement
Reusability requirement
Resource utilization requirement

Interface requirements
This section describes how the software interfaces with other software products or users for input or output. Examples of such interfaces include APIs, web services, shared memory, data streams, and so forth. Most systems would have a GUI. Add more subsections for other interfaces as required.

GUI
Include mock-ups of the key pages or stages of the system. Explain how they are linked. Explain how you addressed above requirements in the design. It is important that the mock-ups are in line with the functional requirements above, e.g., if one of your requirements is “user registration” then one of the screens listed in this section should show a registration page.

Application Programming Interfaces (API)
Explain which interfaces your system offers or which are used by your system. Examples include Google maps and Weka.

System Architecture
Use a class diagram to outline the structure of the system. Explain briefly why you have chosen this architecture. You might want to use Visio or Rational Rose to create these.

System Evolution
This section describes how the system could evolve over time.
Appendix 4: BSc (Hons) in Computing & BIS - Mid Point Marking Rubric (25%)

<table>
<thead>
<tr>
<th></th>
<th>H1 (100 - 70)</th>
<th>H2.1 (69 - 60)</th>
<th>H2.2 (59 - 50)</th>
<th>Pass (49 - 40)</th>
<th>Fail (39-0)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Project Proposal</strong> (20%)</td>
<td>Excellent proposal well researched and could have commercial potential.</td>
<td>Excellent proposal based on valid research and investigation.</td>
<td>Good Proposal well thought out and listed.</td>
<td>Proposal has reached bare minimum standards.</td>
<td>Weak proposal with no details.</td>
</tr>
<tr>
<td><strong>Requirements Engineering</strong> (40%)</td>
<td>Evidence of a comprehensive systematic collaborative (customer/user and developer) iterative approach to requirements gathering as details in the Requirements Specification template.</td>
<td>Evidence of a somewhat systematic, collaborative (customer/user and developer) iterative approach to requirements gathering.</td>
<td>A systematic approach to requirements gathering with limited research or input from customer/user.</td>
<td>An ad hoc approach to requirements gathering with limited research or input from customer/user.</td>
<td>Inadequate requirement gathering.</td>
</tr>
<tr>
<td><strong>High Level Analysis</strong> (8%)</td>
<td>The challenging aspects of the project process and solutions have been identified.</td>
<td>The challenging aspects of the project process are understood and some solutions have been identified.</td>
<td>The challenging aspects of the project process are understood however few solutions have been identified.</td>
<td>The challenging aspects of the project process are understood (e.g. participants for evaluation studies) however no solutions have been identified.</td>
<td>No attempt has been made to address the difficult aspects of the project process provided.</td>
</tr>
<tr>
<td><strong>Prototype</strong> (20%)</td>
<td>There is a working demonstration of an application that provides a visual understanding of all functionality of the application and how a user will interact with it.</td>
<td>There is a working demonstration of an application that provides a visual understanding of the core functionality of the application and how a user will interact.</td>
<td>There is a working demonstration of an application that provides a partial visual understanding of some functionality of the application and how a user will interact.</td>
<td>There is a working demonstration of an application that does not provide a visual understanding of the information system functionality or how a user might interact with it.</td>
<td></td>
</tr>
<tr>
<td><strong>Communication Skills</strong> (12%)</td>
<td>The presentation clearly outlined the project argument. Slides were error-free and logically presented. The speaker was poised and enthusiastic. Questions were excellently answered.</td>
<td>The presentation clearly outlined the project argument. Slides were error-free and logically presented. The speaker was poised and enthusiastic. Questions were very well answered.</td>
<td>The presentation outlined the project argument. The speaker was enthusiastic. Questions were well answered.</td>
<td>The presentation outlined the project argument. Questions were reasonably well answered.</td>
<td>The presentation is unorganised and unclear. Questions were unanswered/poorly answered.</td>
</tr>
</tbody>
</table>

Total Marks 100 which will equate to 25% of the total Project Marks.
**BSHTM4 (BA) - Mid-Point Marking Rubric (25%)**

<table>
<thead>
<tr>
<th></th>
<th>H1 (100-70)</th>
<th>H2.1 (60)</th>
<th>H2.2 (50)</th>
<th>Pass (40)</th>
<th>Fail (30-0)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Project Proposal</strong> (20%)</td>
<td>Excellent proposal well researched and could have commercial/real-world potential</td>
<td>Excellent proposal based on valid research and investigation</td>
<td>Good Proposal well thought out and listed</td>
<td>Proposal has reached bare minimum standards</td>
<td>Weak proposal with no details</td>
</tr>
<tr>
<td><strong>Preliminary Requirements Elicitation</strong> (30%)</td>
<td>Excellent evidence of a comprehensive requirements elicitation process having taken place with project stakeholders.</td>
<td>Good evidence of a comprehensive requirements elicitation process having taken place with most project stakeholders.</td>
<td>Some evidence of a comprehensive requirements elicitation process having taken place with some project stakeholders.</td>
<td>An ad hoc approach to requirements elicitation with limited collaboration with stakeholders.</td>
<td>Inadequate requirements elicitation.</td>
</tr>
<tr>
<td><strong>Preliminary Requirements Analysis</strong> (20%)</td>
<td>Excellent evidence of a comprehensive requirements analysis process having been initiated using proven business analysis tools and techniques.</td>
<td>Good evidence of a comprehensive requirements analysis process having been initiated using business analysis tools and techniques.</td>
<td>Some evidence of a comprehensive requirements analysis process having been initiated using some business analysis tools and techniques.</td>
<td>An ad hoc approach to requirements elicitation with limited use of business analysis tools and techniques.</td>
<td>Inadequate requirements analysis.</td>
</tr>
<tr>
<td><strong>Supporting Technology</strong> (10%)</td>
<td>There is a wire frame/working demonstration of a project web-site that provides an excellent visual representation of all aspects of the requirements elicitation and analysis processes.</td>
<td>There is a wire frame/working demonstration of a project web-site that provides a good visual representation of most aspects of the requirements elicitation and analysis processes.</td>
<td>There is a wire frame/working demonstration of a project web-site that provides some visual representation of some aspects of the requirements elicitation and/or analysis processes.</td>
<td>There is a wire frame/working demonstration of a project web-site that provides no visual representation of any aspects of the requirements elicitation and/or analysis processes.</td>
<td>There is a wire frame/working demonstration of a project web-site that provides no visual representation of any aspects of the requirements elicitation and/or analysis processes.</td>
</tr>
<tr>
<td><strong>Communication</strong> (20%)</td>
<td>The presentation clearly outlined the project argument. Slides were error-free and logically presented. The speaker was poised and enthusiastic. Questions were excellently answered.</td>
<td>The presentation clearly outlined the project argument. Slides were error-free and logically presented. The speaker was poised and enthusiastic. Questions were very well answered.</td>
<td>The presentation clearly outlined the project argument. Slides were error-free and logically presented. The speaker was poised and enthusiastic. Questions were well answered.</td>
<td>The presentation clearly outlined the project argument. Slides were error-free and logically presented. The speaker was poised and enthusiastic. Questions were well answered.</td>
<td>The presentation is unorganised and unclear. Questions were unanswered/poorly answered.</td>
</tr>
</tbody>
</table>

Total Marks 100 which will equate to 25% of the total Project Marks.
# BSHTM4 (DA) - Mid-Point Marking Rubric (25%)

<table>
<thead>
<tr>
<th></th>
<th>H1 (100-70)</th>
<th>H2.1 (60)</th>
<th>H2.2 (50)</th>
<th>Pass (40)</th>
<th>Fail (30-0)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Project Proposal (20%)</strong></td>
<td>Excellent proposal well researched and could have commercial/real-world potential</td>
<td>Excellent proposal based on valid research and investigation</td>
<td>Good Proposal well thought out and listed</td>
<td>Proposal has reached bare minimum standards</td>
<td>Weak proposal with no details</td>
</tr>
<tr>
<td><strong>Requirements Elicitation &amp; Analysis (40%)</strong></td>
<td>Evidence of a comprehensive systematic collaborative (customer/user and developer) iterative approach to requirements elicitation and analysis as detail in the Requirements Specification template.</td>
<td>Evidence of a somewhat systematic, collaborative (customer/user and developer) iterative approach to requirements elicitation and analysis.</td>
<td>A systematic approach to requirements elicitation and analysis with limited research or input from customer/user.</td>
<td>An ad hoc approach to requirements elicitation and analysis with limited research or input from customer/user.</td>
<td>Inadequate requirements elicitation and analysis.</td>
</tr>
<tr>
<td><strong>High Level Analysis (8%)</strong></td>
<td>The challenging aspects of the project process are identified and solutions have been clearly identified.</td>
<td>The challenging aspects of the project process are understood and some solutions have been identified.</td>
<td>The challenging aspects of the project process are understood however few solutions have been identified.</td>
<td>The challenging aspects of the project process are understood however no solutions or use cases have been identified.</td>
<td>No attempt has been made to address the difficult aspects of the project process and no solutions provided.</td>
</tr>
<tr>
<td><strong>Prototype (12%)</strong></td>
<td>There is a wire frame/working demonstration of a data analytics solution that provides an excellent visual representation of all aspects of the requirements elicitation and analysis processes.</td>
<td>There is a wire frame/working demonstration of a data analytics solution that provides a good visual representation of most aspects of the requirements elicitation and analysis processes.</td>
<td>There is a wire frame/working demonstration of a data analytics solution that provides some visual representation of some aspects of the requirements elicitation and/or analysis processes.</td>
<td>There is a wire frame/working demonstration of a data analytics solution that provides little visual representation of few aspects of the requirements elicitation and/or analysis processes.</td>
<td>There is a wire frame/working demonstration of a data analytics solution that provides no visual representation of any aspects of the requirements elicitation and/or analysis processes.</td>
</tr>
<tr>
<td><strong>Communication (20%)</strong></td>
<td>The presentation clearly outlined the project argument. Slides were error-free and logically presented. The speaker was poised and enthusiastic. Questions were answered/poorly answered.</td>
<td>The presentation clearly outlined the project argument. Slides were error-free and logically presented. The speaker was poised and enthusiastic.</td>
<td>The presentation clearly outlined the project argument. Slides were error-free and logically presented. The speaker was poised and enthusiastic.</td>
<td>The presentation clearly outlined the project argument. Slides were error-free and logically presented. The speaker was poised and enthusiastic.</td>
<td>The presentation is unorganised and unclear. Questions were unanswered/poorly answered.</td>
</tr>
<tr>
<td></td>
<td>Questions were very well answered.</td>
<td>enthuastic. Questions were well answered.</td>
<td>enthuastic. Questions were reasonably well answered.</td>
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<td>excellently answered.</td>
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<tr>
<td>Questions were very well answered.</td>
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<td>enthuastic. Questions were well answered.</td>
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<tr>
<td>enthuastic. Questions were reasonably well answered.</td>
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</tbody>
</table>
## Appendix 5: BSc (Hons) in Computing & BIS - Mid Point Marking Rubric (70%)

<table>
<thead>
<tr>
<th>Criteria \Grade</th>
<th>H1 (80 - 100)</th>
<th>H1 (70-79)</th>
<th>H2.1 (60-69)</th>
<th>H2.2 (50-59)</th>
<th>Pass (40-49)</th>
<th>Compensation (35-39)</th>
<th>Fail (0-34)</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Art &amp; Devel</strong></td>
<td><strong>Difficulty (15%)</strong></td>
<td>A project that addresses all complex issues in the area of a specialisation, beyond the programme expectation.</td>
<td>A project that outstandingly addresses complex issues in the area of specialisation.</td>
<td>A project that demonstrates to a very good degree the addressing of complex issues in the area of specialisation.</td>
<td>A project that demonstrates to an adequate degree the addressing of complex issues in the area of specialisation.</td>
<td>A project that somewhat addresses complex issues in the area of specialisation but with some misconceptions.</td>
<td>A project that insufficiently addresses complex issues in the area of specialisation but with some misconceptions.</td>
<td><strong>Mid Point Marking Rubric (100% - Equates to 70% of the overall Project)</strong></td>
</tr>
<tr>
<td><strong>Development</strong></td>
<td><strong>Innovation (10%)</strong></td>
<td>Evidence of exploiting or using a new idea or leading edge feature of new or emerging technology beyond the programme expectations</td>
<td>Evidence of exploiting or using a new idea or leading edge feature of new or emerging technology to an outstanding degree</td>
<td>Evidence of exploiting or using a new idea or leading edge feature of new or emerging technology to a very good degree</td>
<td>Evidence of exploiting or using a new idea or leading edge feature of new or emerging technology to an adequate degree</td>
<td>Evidence of some exploitation or using a new idea or leading edge feature of new or emerging technology but with some misconceptions.</td>
<td>Evidence of inadequate exploitation or in adequate use of a new idea or leading edge feature of new or emerging technology.</td>
<td><strong>Final Year Project Marks</strong></td>
</tr>
<tr>
<td><strong>Completeness</strong></td>
<td><strong>(10%)</strong></td>
<td>Project has commercial potential and addresses all requirements that have been documented beyond the programme expectation.</td>
<td>Project is showing commercial potential and addresses all requirements that have been outstandingly documented.</td>
<td>Project is showing commercial potential and addresses all requirements that have been documented.</td>
<td>Project demonstrates effort but is not at the standard of commercialisation potential.</td>
<td>Project demonstrates adequate effort but is not at the standard of commercialisation potential.</td>
<td>Project demonstrates some effort with misconceptions and is not at the standard of commercialisation potential.</td>
<td><strong>Final Year Project Compensation (35-39)</strong></td>
</tr>
<tr>
<td><strong>Implementation</strong></td>
<td><strong>(30%)</strong></td>
<td>Implementation of the system as demonstrated by the students own coding which is beyond the programme expectation. Use of coding principles beyond programme expectations.</td>
<td>Outstanding implementation of the system as demonstrated by the students own coding. Outstanding use of coding principles.</td>
<td>Very good degree of implementation of the system as demonstrated by the students own coding. Very good use of coding principles.</td>
<td>Good degree of implementation of the system as demonstrated by the students own coding. Adequate use of coding principles.</td>
<td>Adequate implementation of the system as demonstrated by the students own coding. Some use of coding principles.</td>
<td>Inadequate implementation with obvious functionality lacking. Inadequate use of coding principles.</td>
<td><strong>Final Year Project Adequate Implementation (35-39)</strong></td>
</tr>
<tr>
<td><strong>Testing</strong></td>
<td><strong>(10%)</strong></td>
<td>Demonstrates validation and testing as evidenced by end user testing, system testing, class unit testing.</td>
<td>Demonstrating outstanding testing as evidenced by end user testing, system testing, class unit testing.</td>
<td>Demonstrating very good testing as evidenced by system testing, testing of several classes or several programs that combine into a system.</td>
<td>Demonstrating good testing as evidenced by class or program testing.</td>
<td>Demonstrating adequate testing of operations in a class or a functions in a procedural program.</td>
<td>Demonstrating some testing of operations in a class or a functions in a procedural program but with some misconceptions.</td>
<td><strong>Final Year Project Testing (10%)</strong></td>
</tr>
<tr>
<td>Category</td>
<td>Description</td>
<td>Score</td>
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<tr>
<td>Technical Report (inc User Manual if Required) - 10%</td>
<td>The technical report and user manual is organised and written to the standard of a research thesis. All relevant information has been integrated beyond the expectation of the programme.</td>
<td>10%</td>
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<tr>
<td></td>
<td>The technical report and user manual is outstandingly organised and written. All relevant information has been substantially integrated.</td>
<td>9%</td>
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<tr>
<td></td>
<td>The technical report and user manual are very well organised and written. All relevant information has been integrated.</td>
<td>8%</td>
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<tr>
<td></td>
<td>The technical report and user manual are adequately organised and written. All relevant information has been adequately integrated.</td>
<td>7%</td>
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<tr>
<td></td>
<td>The technical report and user manual are somewhat organised and written. All relevant information has been inadequately integrated.</td>
<td>6%</td>
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<tr>
<td></td>
<td>The technical report is unsatisfactory and incomplete.</td>
<td>5%</td>
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</tr>
<tr>
<td>Supervisor Interaction (5%)</td>
<td>The project demonstrates to a standard beyond what is expected, that there is interaction with the supervisor as evident by monthly reflective journals, emails, midterm presentation and meetings.</td>
<td>5%</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>The project demonstrates to an excellent standard that there is interaction with the supervisor as evident by monthly reflective journals, emails, midterm presentation and meetings.</td>
<td>4%</td>
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</tr>
<tr>
<td></td>
<td>The project demonstrates to a very high standard that there is interaction with the supervisor as evident by monthly reflective journals, emails, midterm presentation and meetings.</td>
<td>3%</td>
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</tr>
<tr>
<td></td>
<td>The project adequately demonstrates that there is interaction with the supervisor as evident by monthly reflective journals, emails, midterm presentation and meetings.</td>
<td>2%</td>
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</tr>
<tr>
<td></td>
<td>The project somewhat demonstrates that there is interaction with the supervisor as evident by monthly reflective journals, emails, midterm presentation and meetings.</td>
<td>1%</td>
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</tr>
<tr>
<td></td>
<td>The project inadequately demonstrates that there is interaction with the supervisor as evident by monthly reflective journals, emails, midterm presentation and meetings.</td>
<td>0%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Presentation (10%)</td>
<td>The project argument was proffered in a manner that was beyond the normal programme expectations for the presentation. Slides were error-free and logically presented. The speaker was poised and enthusiastic. Questions were answered beyond the expectation of the programme.</td>
<td>10%</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>The project argument was outstandingly clear in the presentation. Slides were error-free and logically presented. The speaker was poised and enthusiastic. Questions were outstandingly answered.</td>
<td>9%</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The project argument was very clear in the presentation. Slides were error-free and logically presented. The speaker was poised and enthusiastic. Questions were very well answered.</td>
<td>8%</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>The presentation adequately outlined the project argument. Slides were adequately presented. The speaker was poised and enthusiastic. Questions were adequately answered.</td>
<td>7%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The presentation somewhat outlined the project argument. Slides were somewhat presented with some misconceptions. The speaker was somewhat enthusiastic. Some questions were answered.</td>
<td>6%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The presentation inadequately outlined the project argument. Slides were inadequately presented. The speaker was inadequately presented and lacked enthusiasm. Questions were inadequately answered.</td>
<td>5%</td>
<td></td>
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</tr>
</tbody>
</table>
### BSHTM4 (BA) – Final Presentation Marking Rubric (70%)

<table>
<thead>
<tr>
<th></th>
<th>H1</th>
<th>H2.1</th>
<th>H2.2</th>
<th>Pass</th>
<th>Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication (10%)</td>
<td>The presentation comprehensively outlined the business analytics project. The speaker was poised and enthusiastic. Questions were excellently answered.</td>
<td>The presentation outlined the business analytics project in detail. The speaker was poised and enthusiastic. Questions were very well answered.</td>
<td>The presentation outlined the business analytics project. The speaker was poised and enthusiastic. Questions were answered.</td>
<td>The presentation somewhat outlined the business analytics project. The speaker was poised and enthusiastic. Questions were reasonably well answered.</td>
<td>The presentation is unorganised and unclear. Questions were unanswered/poorly answered.</td>
</tr>
<tr>
<td>Writing &amp; Presentation of Results (35%)</td>
<td>The dissertation is written in a formal academic style; with very clear statements and conclusions and discussion of the project findings and implication, and use proper Harvard Referencing Style (HRS). Excellent statement and clear presentation of results using tables, graphs effectively. Conclusions are clearly supported by the results. The results will give an answer to the data analytics research questions asked; There is a connection from the results to the research questions.</td>
<td>The dissertation is written in a formal academic style with clear statements and conclusions, and use proper HRS. Very good statement and presentation of results using tables, graphs effectively. For some results more appropriate means of presentation could have been utilised. Conclusions are clearly supported by the results.</td>
<td>The dissertation is written in a formal academic style but missing in conclusions and discussions not perfect HRS. Good statement and presentation of results using tables, graphs effectively. For some results more appropriate means of presentation could have been utilised. Conclusions drawn could be more clearly supported by the results.</td>
<td>The dissertation is not well structured and does not use proper academic style; there are very few references and proper HRS is not used. There is a statement and presentation of results (perhaps incomplete), however, there is a lack of clarity and less effective use of tables, graphs for illustration. Conclusions are not clearly supported by the results.</td>
<td>The dissertation is poorly written and the statements are unclear and lacks conclusions and discussions and proper referencing style (HRS). Grossly inaccurate or incomplete presentation and statement of results. Lack of clarity and usage of tables, graphs for illustration. Conclusions are not supported by results.</td>
</tr>
<tr>
<td>Difficulty / Business Analysis Skills (15%)</td>
<td>A project that addresses complex issues. A project that performs complex analyses using sophisticated business analytics techniques.</td>
<td>A project that analyses and partially addresses some complex issues.</td>
<td>Wide scopes of issues are addressed, but the analysis and implementation lack depth.</td>
<td>A project that does not implement effectively or bypasses some of the more difficult aspects of the proposal.</td>
<td>A project with very little innovative analysis and use of analytical approaches.</td>
</tr>
<tr>
<td>Innovation (10%)</td>
<td>An innovative solution based on novel research to produce a commercial/real-world requirements specification or with publishing potential in a peer review publication.</td>
<td>An innovative concept or a novel extension of existing business analysis applications and techniques.</td>
<td>An idea that merges ideas from a number of existing sources.</td>
<td>A project with limited functionality but with some innovative features.</td>
<td>A project that reproduces, without development, ideas of existing sources.</td>
</tr>
<tr>
<td>Supporting Technology (10%)</td>
<td>Exploits leading edge features of new or emerging technologies/methodologies or exploits chosen technologies to the fullest extent possible appropriate to the analysis.</td>
<td>A project that uses complex or difficult features of technology/methodology appropriately. Exploits many features of the chosen technology.</td>
<td>A project that uses less complex technology/methodology to a high standard or integrates a number of technologies.</td>
<td>The project uses standard technologies/methodologies with little innovation.</td>
<td>The project uses a standard technology/methodology in a very basic and rudimentary manner.</td>
</tr>
<tr>
<td>Completeness (10%)</td>
<td>Project is close to commercial/real-world implementation or publication.</td>
<td>Project is excellent but would need more work to attain commercial/real-world implementation or publication.</td>
<td>Project demonstrates a good deal of work by the learner, but where the project contains few innovative features.</td>
<td>Functionality is partly complete or obvious extensions are not implemented.</td>
<td>The learner does not understand aspects of the functionality or the data analysis.</td>
</tr>
<tr>
<td>Validation/Verification (10%)</td>
<td>Detailed evidence of validation and verification of results.</td>
<td>Good evidence of validation and verification of results.</td>
<td>Some evidence of validation and verification of results.</td>
<td>Little evidence of validation and verification of results.</td>
<td>No evidence of validation and verification of results.</td>
</tr>
<tr>
<td></td>
<td>H1</td>
<td>H2.1</td>
<td>H2.2</td>
<td>Pass</td>
<td>Fail</td>
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<tr>
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<td>--------------------------------------------------------------------</td>
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<td>-------------------------------------------</td>
<td>----------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Communication</strong></td>
<td>The presentation comprehensively outlined the data analytics project. The speaker was poised and enthusiastic. Questions were excellently answered.</td>
<td>The presentation outlined the data analytics project in detail. The speaker was poised and enthusiastic. Questions were very well answered.</td>
<td>The presentation outlined the data analytics project. The speaker was poised and enthusiastic. Questions were answered.</td>
<td>The presentation somewhat outlined the data analytics project. The speaker was poised and enthusiastic. Questions were reasonably well answered.</td>
<td>The presentation is unorganised and unclear. Questions were unanswered/poorly answered.</td>
</tr>
<tr>
<td>(10%)</td>
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</tr>
<tr>
<td><strong>Writing &amp;</strong></td>
<td>The dissertation is written in a formal academic style; with very clear statements and conclusions and discussion of the project findings and implication, and use proper Harvard Referencing Style (HRS) Excellent statement and clear presentation of results using tables, graphs effectively. Conclusions are clearly supported by the results. The results will give an answer to the data analytics research questions asked; There is a connection from the results to the research questions;</td>
<td>The dissertation is written in a formal academic style with clear statements and conclusions, and use proper HRS; Very good statement and presentation of results using tables, graphs effectively. For some results more appropriate means of presentation could have been utilised. Conclusions are clearly supported by the results.</td>
<td>The dissertation is written in a formal academic style but missing in conclusions and discussions not perfect HRS. Good statement and presentation of results using tables, graphs effectively. For some results more appropriate means of presentation could have been utilised. Conclusions could be more clearly supported by the results.</td>
<td>The dissertation is not well structured and does not use proper academic style; there are very few references and proper HRS is not used. There is a statement and presentation of results (perhaps incomplete), however, there is a lack of clarity and less effective use of tables, graphs etc. Conclusions are not clearly supported by the results.</td>
<td>The dissertation is poorly written and the statements are unclear and lacks conclusions and discussions and proper referencing style (HRS). Grossly inaccurate or incomplete presentation and statement of results. Lack of clarity and usage of tables, graphs etc. Conclusions are not supported by results.</td>
</tr>
<tr>
<td><strong>Presentation of</strong></td>
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<td><strong>Results</strong></td>
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<td>(25%)</td>
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<td><strong>Difficulty / Data</strong></td>
<td>A project that addresses complex issues. A project that performs complex analyses using sophisticated data analytics.</td>
<td>A project that analyses and partially addresses some complex issues.</td>
<td>Wide scopes of issues are addressed, but the analysis and implementation lack depth.</td>
<td>A project that does not implement effectively or bypasses some of the more difficult aspects of the proposal.</td>
<td>A project with very little innovative analysis and use of analytical approaches.</td>
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<tr>
<td><strong>Analysis Skills</strong></td>
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<td>(15%)</td>
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<tr>
<td>Innovation (10%)</td>
<td>An innovative solution based on novel research to produce a commercial/real-world data analytics tool or with publishing potential in a peer review publication</td>
<td>An innovative concept or a novel extension of existing data analytics applications.</td>
<td>An idea that merges ideas from a number of existing sources.</td>
<td>A project with limited functionality but with some innovative features.</td>
<td>A project that reproduces, without development, ideas of existing sources</td>
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<td>-------------------------------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>Technology (20%)</td>
<td>Exploits leading edge features of new or emerging technologies or exploits chosen technologies to the fullest extent possible appropriate to the analysis.</td>
<td>A project that uses complex or difficult features of technology appropriately. Exploits many features of the chosen technology.</td>
<td>A project that uses less complex technology to a high standard or integrates a number of technologies.</td>
<td>The project uses standard technologies with little innovation.</td>
<td>The project uses a standard technology in a very basic and rudimentary manner.</td>
</tr>
<tr>
<td>Completeness (10%)</td>
<td>Project is close to commercial/real-world implementation or publication.</td>
<td>Project is excellent but would need more work to attain commercial real-world implementation or publication.</td>
<td>Project demonstrates a good deal of work by the learner, but where the project contains few innovative features.</td>
<td>Functionality is partly complete or obvious extensions are not implemented.</td>
<td>The learner does not understand aspects of the functionality or the data analysis.</td>
</tr>
<tr>
<td>Testing/Evaluation (10%)</td>
<td>End user testing/ Evidence of Evaluation/Simulation/ reliability and validity of the results.</td>
<td>Demonstration of System testing.</td>
<td>Demonstration of testing a main component of the solution.</td>
<td>Demonstration of testing part of a main component of the solution.</td>
<td>No evidence of testing or evaluation.</td>
</tr>
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</table>
## Appendix 6: Showcase Marking Rubric (5%)

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<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Show</td>
<td></td>
<td>Fail</td>
</tr>
<tr>
<td>Poster</td>
<td>Poster that accurately illustrates the project is available</td>
<td>2</td>
</tr>
<tr>
<td>Demonstration</td>
<td>Student demonstrates application</td>
<td>1</td>
</tr>
<tr>
<td>Summary of feedback</td>
<td>Documentation of comprehensive summary of feedback from general public</td>
<td>2</td>
</tr>
</tbody>
</table>
### Appendix 7: Invention Disclosure Form

**NCI INVENTION DISCLOSURE FORM**

1. **Title of Invention**

2. **Inventors**

<table>
<thead>
<tr>
<th>Name</th>
<th>School/Research Institute</th>
<th>Affiliation with Institute (i.e. department, student, staff, visitor)</th>
<th>Address, contact phone no., e-mail</th>
<th>% Contribution to the Invention</th>
</tr>
</thead>
<tbody>
<tr>
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</table>

3. **Contribution to the Invention**

   Each contributor/potential inventor should write a paragraph relating to his/her contribution and include a signature and date at the end of the paragraph.

4. **Description of Invention**

   (Please highlight the novelty/patentable aspect. Attach extra sheets if necessary including diagrams where appropriate). What is novel, the ‘inventive step’? For more information on patents, please look at [http://www.patentoffice.ie/en/patents.aspx](http://www.patentoffice.ie/en/patents.aspx)

5. **Why is this invention more advantageous than present technology?**

   What is its novel or unusual features? What problems does it solve? What are the problems associated with these technologies, products or processes? Explain how this invention overcomes these problems (i.e. what are its advantages).
6. What is the current stage of development / testing of the invention?

7. List the names of companies which you think would be interested in using, developing or marketing this invention

8. Funding Partner(s)

<table>
<thead>
<tr>
<th>Government Agency &amp; Department</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>% Support</td>
<td></td>
</tr>
<tr>
<td>Contract/Grant No.</td>
<td></td>
</tr>
<tr>
<td>Contact Name</td>
<td></td>
</tr>
<tr>
<td>Phone No.</td>
<td></td>
</tr>
<tr>
<td>Address</td>
<td></td>
</tr>
</tbody>
</table>

| Industry or other Sponsor     |  |
9. Where was the research carried out?

10. What is the potential commercial application of this invention?

11. Was there transfer of any materials/information to or from other institutions regarding this invention?
    If so please give details and provide signed agreements where relevant.

12. Have any third parties any rights to this invention?
    If yes, give names and addresses and a brief explanation of involvement.
13. Are there any existing or planned disclosures regarding this invention? Please give details.

14. Has any patent application been made? Yes/No
   If yes, give date: _______________  Application No.: _______________
   Name of patent agent: _________________________________
   Please supply copy of specification.

15. Is a model or prototype available? Has the invention been demonstrated practically?
Appendix 8: Preliminary Commercialisation Plan

Preliminary Commercialisation Plan

1. Project Title


2. Student Name


3. Description of Invention
   (Please highlight the novelty/patentable aspect. Attach extra sheets if necessary including diagrams where appropriate). What is novel, the ‘inventive step’? For more information on patents, please look at http://www.patentoffice.ie/en/patents.aspx


4. Why is this invention more advantageous than present technology?
   What is its novel or unusual features? What problems does it solve? What are the problems associated with these technologies, products or processes? Explain how this invention overcomes these problems (i.e. what are its advantages).


5. List the names of companies which you think would be interested in using, developing or marketing this invention

6. What is the potential commercial application of this invention?

7. Was there transfer of any materials/information to or from other institutions regarding this invention?
   If so please give details and provide signed agreements where relevant.

8. Have any third parties any rights to this invention?
   If yes, give names and addresses and a brief explanation of involvement.