Project Title

Student Name

A project report submitted in partial fulfilment for the degree of

BSc (Hons) [Your Course]

School of Engineering and Computing

University of Lancashire

Abstract

Remove any text highlighted in yellow before final submission with Deliverable 4. The abstract is not marked or required, but will give your overall report a professional appearance.

The abstract is the summary of the project carried out. It should brief, between a quarter and half a page. Unnumbered chapter headings, as above, are entered using the 'Heading (Unnumbered)' style, which automatically starts a new page.

This template starts the page numbering at the foot of this page. That is, the first page does not have a number.

Attestation

I understand the nature of plagiarism, and I am aware of the University's policy on this.

I certify that this document reports original work by me during my University project. I also confirm that I adhere to the University's legal and ethical guidelines for undergraduate projects in Computing.

Signature: _____

Date:

Acknowledgements

Fill this in with your final written deliverable (deliverable 4). Acknowledge anyone who has helped you in your work such as your supervisor, technical support staff, fellow students, or external organisations. Acknowledge the source of any work that is not your own.

Table of Contents

The table of contents below is automatically generated from the paragraphs of style 'Heading 1' to 'Heading 3' and 'Heading (Unnumbered)'. To update this after revisions, right-click in the table and choose 'Update Field' for the entire table. It is also possible to left-click the table and press F9 to update the entire table. Delete this paragraph and the one below before submission.

Sometimes Word does not automatically update references to other parts of the document, such as captions, Table of Contents and cross-references. To update everything, select the whole document by pressing Ctrl+A and then either press F9 or right-click anywhere and click on 'Update Field'. Confirm all prompts by selecting 'Update entire table' and clicking OK. Sometimes the font changes on update so check it is the correct font face before submitting your work. You need to set it to Calibri.

List of Figures

Similarly, you can automatically generate a list of ‘Figures’. Right-click a figure (e.g. image or diagram) and add a caption labelled ‘Figure’ and ‘below selected item’. To update this after revisions, right-click in this table and choose Update Field (or use F9) and then choose to update the entire table. Delete this paragraph before submission.

List of Tables

Similarly, you can automatically generate a list of 'Tables'. Select a table, right-click it and add a caption labelled 'Table' and 'above selected item'. To update this after revisions, right-click in this table and choose Update Field (or use F9) and then choose to update the entire table. Delete this paragraph before submission.

1 Introduction

(Deliverable 2) This Section should expand (or clarify) the problem space your project is situated in.

For editorial consistency, it is important to use Word styles properly.

Chapters are entered using the 'Heading 1' paragraph style. The Heading 1 style automatically moves to the start of a new page and supplies the next chapter number. Pressing enter on a 'Heading 1' heading automatically inserts a 'Heading 2' heading underneath.

Most text uses the 'Normal Project Body' paragraph style with 11-point Avenir Next LT Pro, 1.5-line spacing, single-sided pages.

In general, use the default spacing that headings and paragraphs give you. Avoid using new-lines or spaces to format text. If you need to use quotes, preferably use single curly quotes '...'. If you wish to emphasise something, use the 'Emphasis' style. In addition, also a 'Strong' style is preconfigured.

Remember to Save frequently while you are working! Check that AutoSaving is enabled under options -> save -> 'Save AutoRecover information every 5 minutes'.

1.1 Problem Statement

In this section you should clearly identify **what** the problem is and should be broken down into component parts where necessary**. Make use of headings and sub-headings (using the styles in this document) throughout your report as appropriate.**

I cannot provide more detailed titles of sub headlings/sections for you as every project is different. You should discuss any appropriate standards and legal implications at this point.

1.2 Significance of the Problem

You should also indicate **why** the problem is significant and worthy of attention. You should discuss the impact of both solving and not solving your stated problem at this point.

1.3 Aims and Objectives

Finally you should discuss how you are going to work towards solving the problem. You should state a single high level aim within the context of the problem defined and list 6 to 8 objectives that are progressive and measurable that work towards meeting that aim.

2 State of the Art

(Deliverable 2) This should be a review of the current body of knowledge in your chosen problem area and should clearly outline the boundary between what is known in your chosen area of work and what is not known. This should be in the form of an academic literature review. You should also note any different research methodologies that have been applied within the existing body of knowledge in your chosen problem area and note any implications for your own work.

Subsections are entered using the 'Heading 2 and Heading 3' paragraph styles (all these heading styles are self-numbering). Try to avoid going lower than Heading 3 if possible.

2.1 Example Subheading

Some example text here

2.1.1 Example subsection

Some more example text here

Do not list your references at the end of this chapter, list them in the REFERENCES section at the end of this report template. You must amalgamate all your references from the whole report together, listing them in alphabetical order by author surname. I'm not being prescriptive about what reference/citation style you use, the important things is to be consistent throughout and cite correctly for the referencing style you have chosen. If you want a suggestion you can use APA for reference styling.

3 Methodology

(Deliverable 2) This should outline a high level plan for how you are going to address the problem. It may be informed by the methodologies identified in the 'State of the Art' section and should outline how your methodology is going help achieve all the objectives outlined in pursuit of the main aim presented in your introduction.

You should discuss how you will progress through the objectives and how you will know when they have been completed. You should also outline your intended process for evaluation at this point (to check whether or not you have addressed the projects overall aim).

Finally you should provide an expanded indication on how you plan to use your remaining time/resources on the project.

3.1 Another Example Section

As an example of a figure, consider Figure 1.

Captions are entered through the ribbon menu under 'References' -> 'Insert Caption' or through right-clicking an image and selecting 'Insert Caption'. Add the caption text in the box, separated with a dash as the example below shows.

Each figure is numbered automatically, and it is good academic writing to cite the figure in the body of your text. (e.g. "see Figure 1", or "Figure 1 illusatrates a highly technical diagram").

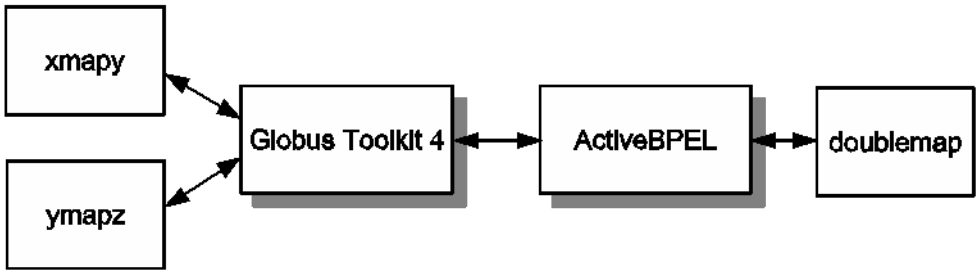

Figure 1 - Highly Technical Diagram

4 Design

(Deliverable 3 comprises the fourth and fifth sections of your overall report).

4.1 Requirements Analysis and Specification

This section will present an analysis of the projects requirements and provide a specification for a solution that attempts to meet those requirements.

4.2 Solution Design

The section should provide a design outline that is appropriate for your project (E.g. system architecture, network architecture, UML diagrams, UI Design etc.). This will be a substantial section and may need to be split into sub-sections

4.3 Development Methodology

This section should briefly discuss how the proposed development methodology was used in practice and whether there were any changes to approach to the originally planned problem/methodology.

5 Implementation

(Deliverable 3) This section details the implementation of your project. Avoid dumping large code listings in here with little explanation. Your markers will not be scouring through code in your report.

5.1 Key Problems

This section should provide a critical review of the key problems encountered during your implementation and how they were overcome.

Pseudo code can be used to explain important parts of your project, but actual code samples should be included in an appendix away from your main report.

5.2 Technical Highlights

The section should showcase the level of technical challenge that your project has achieved. It is a chance to show off the technical complexity of the work undertaken that may not be clear from the design section. If the implementation is substantial you may need to break this section down into component parts. , You should NOT simply describe step by step exactly what has been done, be analytical rather than descriptive if possible and showcase your technical knowledge.

Pseudo code is preferable, as it better conveys your understanding of what is going on in the code. You can include small code snippets, but don't just add huge chunks of code with little discussion. This does not help convey whether you actually understand the code. Pseudocode or small snipperts can be used to explain important parts of your project, but larger code samples should be included in an appendix away from your main report.

Pseudocode (preferred) or actual code snippets can be formatted using the 'Code' style. An example is shown below. It can be a little bit tricky to keep the formatting when pasting from an IDE but the following works for most IDEs: Copy the text from the IDE, paste it in Word, select the pasted code and change the style to 'code'. It is worth noting that spell checking is deactivated for the 'Code' style.

```
using System;

namespace HiWorld
{
   internal static class Program
   {
      private static void Main(string[] args)
      {
         Console.WriteLine("Hello World!");
      }
   }
}
```

5.3 Testing

You should also provide a review and reflection of the testing processes undertaken during the development of your project and make use of appendices for presenting test data where necessary.

Make sure to write the whole text first and select the part you want to highlight afterwards. When there is no selection, Word applies the selected style to the whole paragraph.

To add a caption to a table, either select the whole table (e.g. by clicking on the + symbol in the upper left corner of the table), right-click it and choose 'Insert Caption' or click in any table cell and select 'References' -> 'Insert Caption' from the ribbon menu. Choose 'Table' as label and 'above the item' as position. Add the caption text in the box, separated with a dash as the example below shows.

Table 1 – Testing Summary

6 Evaluation, Discussion and Conclusions

(Deliverable 4) This section is a reflective account of how your project achieved what it set out to do

6.1 Evaluation Process

This section should provide a critical reflection of the evaluation process itself. You should present your approach to evaluation and relect on it.

6.2 Diversity Equality and Inclusion

Write a short reflection on whether your project takes account of principles related to diversity, equality, and inclusion. If not, suggest ways in which these considerations could make your project stronger or more impactful with further work.

6.3 Evaluation Discussion

This should be an evaluation of your project artefact overall. You should revisit the original aims and evaluate the solution developed against the problem domain.

This should be a critical reflection of the evaluation outputs (findings) against the problem domain identified. You should state at this point whether or not (or to what extent) the solution (artefact) provided solves the problem you set out to solve.

6.4 Critical Reflection

In this section you should critically reflect on how the project was managed and any feedback you have received from your markers from past components and discuss how this feedback could be addressed.

This section is about yourself. Be honest. Look at where you were situated at the beginning of the project and where you are now. What have you learnt on a personal level, what have you found out about yourself? Try to reflect on what wider experiential learning has taken place.

The purpose of the critical reflection process is to highlight strengths, correct performance weaknesses, and develop unused skills and abilities. To do this, you must be willing to recognise areas that need improvement or development.

6.5 Conclusions and Further Work

This short final section (approximately half a page) should summarise the overall outcome of the project and outline any scope for further work.

References

Cuevas, R., Cuevas, Á., Cabellos-Aparicio, A., Jakab, L., & Guerrero, C. (2010a). A collaborative P2P scheme for NAT Traversal server discovery based on topological information. *Computer Networks, 54*(12), 120-122.

Cuevas, R., Cuevas, Á., Cabellos-Aparicio, A., Jakab, L., & Guerrero, C. (2010b). Book Section. In J. D. Kramer (Ed.), *This is a another Book released in the same year* (Vol. 54, pp. 150-180). London: PressAwesome.

Greene, D., & Williams, P. C. (1997). *Linear Accelerators for Radiation Therapy* (2nd ed.). Bristol and Philadelphia: IOP Publishing Ltd.

Jacobson, J., & Andersen, O. (1997). Software Controlled Medical Devices. In *SP Report 1997:11.* Sweden: Swedish National Testing and Research Institute.

Ji, H., & Turner, K. J. (1999). Specification and Verification of Synchronous Hardware using LOTOS. In J. Wu, S. T. Chanson, & Q. Gao (Eds.), *Formal Methods for Protocol Engineering and Distributed Systems (FORTE XII/PSTV XIX)* (pp. 295-312). London: Kluwer Academic Publishers.

Turner, K. J., & Jennings, M. A. (2002). The Rules of Sailing Races for Hand-Held Devices. *J. Navigation, 23*(5), 114-240.

University of Stirling. (2002). *Computing Science and Mathematics Research*. Retrieved March 01, 2017, from http://www.cs.stir.ac.uk/research

The reference list above is generated by Word. Under 'References' -> 'Manage Sources' it is possible to add new references which can later be inserted in the report with 'Insert Citation'. Example: (Cuevas, Cuevas, Cabellos-Aparicio, Jakab, & Guerrero, A collaborative P2P scheme for NAT Traversal server discovery based on topological information, 2010a)

Alternatively, you can add a new reference and immediately insert it as a citation by moving the cursor to the place where you want to insert the citation and then choosing 'References' -> 'Insert Citation' -> 'Insert New Source' from the ribbon menu.

You can hide parts of a citation by right-clicking on it, selecting 'Edit Citation' and ticking the checkboxes under 'Suppress'. In the same dialog a reference to specific pages of the cited source can be added (which will not be displayed in the references list). Example (same as above but with 'Author' suppressed and page 120 added): (A collaborative P2P scheme for NAT Traversal server discovery based on topological information, 2010a, p. 120)

Keep in mind that uncited sources will still appear in the references list above. Go to 'References' -> 'Manage Sources' to see which sources are cited and which are not. Sources in 'Current List' which have a checkmark are cited.

All references listed should be cited somewhere in the main body of the report.

Appendix 1 – Project Proposal

Your first appendix should be a copy of your Project Proposal.

You may have one or more appendices containing detail, bulky or reference material that is relevant though supplementary to the main text: perhaps additional specifications, tables or diagrams that would distract the reader if placed in the main part of the report. Make sure that you place appropriate cross-references in the main text to direct the reader to the relevant appendices.

Do not blindly include all your code in the appendix or the body. Only include the parts you refer to in the report. You can put those parts either in the appendix or in the body (e.g. in the "Implementation" part).

Appendix 2 – Title of Appendix

You may have one or more appendices containing detail, bulky or reference material that is relevant though supplementary to the main text: perhaps additional specifications or testing tables, participant information/consent sheets etc. These can provide supplementary evidence of your project activity but may be too bulky and distract from the flow of your main report. Make sure that you place appropriate cross-references in the main text to direct the reader to the relevant appendices.

Do not blindly include all your code in the appendix or the body. Only include the parts you refer to in the report. You can put those parts either in an appendix or in the body (e.g. in the "Implementation" part) but pseudocode is preferred in the report to display your understanding of any underlying algorithms implemented.