



TSN 309/10

Computer Systems and Networks Project

Course Guide

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1.0 Introduction

T*SN 309/10 Computer Systems and Networks Project* is a 10 credit course to be taken after you have completed at least 90 credits or the equivalent, including any credit transfer or advanced standing credit that you have been granted. Unlike most other courses that you have taken, this project course will not have the usual five study units. You will need to plan your schedule carefully so that you can complete your project over the two semesters normally allocated for its completion.

The project is a level 300 course in the programme and is usually taken in the final year. It is the climax of your undergraduate study. Through it, you will learn how to apply the skills and knowledge that you have acquired on a real problem or to make an in-depth investigation of a specific technical issue.

This course guide will provide you with information on how to go about the various stages of the project. It will also show you how your project will be assessed. In each semester, the project topics will cover a very wide scope. Each project will have its own particular technical issues. Thus, this course guide and the members of the course team can only provide you with general information on how to perform the project work. An important objective of this project is to train you to carry out independent study and work. Your own efforts will determine the outcome of your project.

You will be assigned a Project Supervisor, who can be a WOU tutor or any other person deemed suitable by the school. A WOU academic staff member will be assigned as the Internal Examiner (IE) of your project. You will need to work closely with your supervisor. You will meet with him/her for face-to-face discussions during your project meetings. The personal guidance by your supervisor will help you to successfully complete your project.

This final year project report will probably be the first publication that you have ever produced. It will be the evidence that you can proudly display on your bookshelf to show that you have earned your degree through your own ability and hard work.

2.0 Course Objectives and Learning Outcome

Course objectives

This course aims to give you the opportunity to:

1. Conduct independent study and work.
2. Gain a thorough understanding of the theoretical and practical aspects of computer systems and networks, and their interrelationships.
3. Equip yourself with advanced scientific and engineering skills related to networking and computer systems.
4. Develop communication skills, initiative, professionalism and the ability to work independently as well as with others.
5. Gain the knowledge and skills necessary for your professional career.
6. Gain in-depth knowledge of a topic of current interest.
7. Gain experience in writing a formal report.

Course outcomes

By the end of this course, you should be able to:

1. Apply the principles and mechanisms related to computer systems and networks.
2. Apply principles of security to the evaluation of existing networks, and design a secure network to operate computing equipment and software systems effectively.
3. Apply a combination of techniques from both networking and computing.
4. Formulate appropriate assessment criteria and evaluate computer-based systems.
5. Develop, implement and maintain large wired and wireless networks.
6. Conduct research in chosen fields of technology.

3.0 Timetable

Specific milestones for the project are given in the next section. However, you are expected to draw up a timetable to schedule your work.

The milestones in the timetable include meetings and deadlines to assist you in pacing your work, and to enable your supervisor to monitor your progress throughout the two semesters of your project. You must submit the Initial, Interim and Final Reports in time, and attend tutorials and presentations if these are arranged.

You must adhere to the submission dates of the TMAs, which comprise of two reports and an oral presentation. It is particularly important that you meet the cut-off date for the submission of the Final Report. The Final Report will be assessed by your supervisor and moderated by the internal examiner. After their assessment is completed, the IE may require you to attend an oral examination.

4.0 Study Programme

You are expected to make an appointment to meet with your tutor in the **first week** of the semester in which your project course commences. In this first meeting, the project proposal will be discussed and you will be given suggestions on how your project can be carried out. The project topic may be your own idea or one that is offered by the university. Your tutor will help you to establish an outline strategy and realistically assess the level of difficulty of the project based on the time and resources available for its completion. In this meeting, you and your supervisor will discuss and agree on the sources of information for a literature survey and your reading list. Most projects will include a reasonably comprehensive review of the existing literature before the design-build-test or implementation part is carried out.

You must also agree on the frequency and the mode (telephone, email, Skype or WawasanLearn discussion board) of future discussions with your supervisor.

By the **3rd week**, you should have the topic of your project confirmed and be well under way with the literature survey. In the **8th week**, you will submit your **Initial Report**, which will contain a project definition, a literature review and a project plan. After assessing your initial report, your supervisor will hold a tutorial meeting with you to develop the main part of the project.

The main part of your project will be carried out between the **8th week and 38th week**. During this 8 month long period, you may contact your supervisor for advice on your project. You will be required to submit an **Interim Report** in the **25th week**. The interim report should show that you have completed a substantial part of the project work. This report will be assessed and will be followed by a tutorial meeting to discuss the final part of the project. You are required to give an **oral presentation** in the **26th week**. Your supervisor will offer you advice before you begin to write the **Final Report** that is due for submission by the **40th week**. Details of the requirements for each report are given in Sections 8 and 9 of this course guide. You may be required to attend an oral examination after the submission of the final report. The oral examination, if required, will take place in the **46th week**.

This year-long project offers you an opportunity to develop the habit of keeping a *project diary* with entries at weekly intervals. You will find this practice invaluable when you are working on larger projects or in higher-level research. Your supervisor may monitor your progress by requiring you to submit a monthly work summary extracted from the diary. This diary will be very useful when you write your interim and final reports. It can also help in the oral examination if you are asked about the problems that you encountered at the various stages of the project and how you overcame them. The diary will be of value only if an accurate account of the project work is recorded.

5.0 Level, Scope and Commitment

L*evel:* While the project must be of a level worthy of an honours degree, starting with an overambitious aim quite often causes a student to end with either uncompleted portions or to end up with a shallow treatment of the project objective.

The project is taken at level 300 of the programme which is equivalent to the final year in full time study. You are expected to have acquired the level of knowledge required for carrying out the project and you will have to apply that knowledge to the project. You will need to develop new or more advanced skills necessary to execute the project. These may include skills in writing computer programs, using special software or in handling laboratory equipment. Background reading and the literature survey play an important role here.

Remember that the project is not for a postgraduate research degree, so you are not expected to make a discovery or an original contribution to the knowledge of the field. The project places more importance on training you to methodically follow the procedure and to independently implement the year-long project from its beginning to its successful conclusion.

Scope: When defining the scope of your project with your supervisor, try not to make it too wide in terms of coverage. On the other hand, an in-depth investigation on a particular topic may need you to be focused on a narrow area. In the latter case, you will need to assess whether you have enough knowledge in that narrow area to do the project. You should adjust your aims to the level expected, and based on the time and resources available to you.

You are not expected to define your project with precision at the beginning. Very often, a project is initially only loosely defined. You will need to adjust and redefine your aims and objectives in the light of issues that crop up as you proceed further. Your initial and interim reports will give you the opportunity to justify any change of scope.

Commitment: The study time you are expected to commit to the project is 400 hours. At this phase of your programme you may need no encouragement to work hard to complete your project; however, you should know when to leave things aside and take a break to rejuvenate the mind. You may at times encounter obstacles and dead ends in your work. These ups and downs are an inevitable part of study life as well as working life, and you will have to learn to handle them. When things seem too difficult for you to work out alone, you should seek your supervisor's help.

A way for you to take your project seriously is to find a topic that interests you deeply. Remember that poor performance will bring disappointment to yourself and your supervisor. This is an honours level final year course and should be treated as such.

6.0 Learning Support

Unlike other courses, this project course has no study units and very little supplementary material. You should consult your course coordinator if you face any difficulties in reading this course guide or with your supervisor.

This project course aims to inculcate independent study and work. The programme of study is largely in your own hands. The university will endeavour to give you the best possible support, and to see that your work is properly assessed. As assessment is intertwined with the provision of support, your supervisor and the university are responsible to provide both.

A supervisor will normally supervise several students at one time. You should contact him/her on academic problems. However, the supervisor may refer to the internal examiner (IE), who is usually the course coordinator, to help find solutions to your problems. Based on your Initial and Interim Reports, your project supervisor will report to the IE on issues such as the lack of facilities or other weaknesses that you may encounter in doing your project.

The Project Supervisor assesses your Final Report. The IE will moderate selected Final Reports and may provide comments to your supervisor. Your supervisor will then communicate these comments to you. The IE will call you for an oral examination if required.

The result of the project given by the supervisor and the IE will be considered and approved by the Award Committee. The Award Committee is responsible for deciding each student's final status.

7.0 Assessment

The assessment of the project will be based on the following components and weightings:

1. TMA 1 (compulsory): Initial Report (10%)
2. TMA 2 (compulsory): Interim Report + oral presentation (20% + 10%)
3. Examination (compulsory): Final Project Report (60%)
4. Oral examination (at the discretion of the School).

The responsibility for the assessment of these components will be as follows:

1. Initial and Interim Reports: Project Supervisor. IE monitors selected reports.
2. Oral presentation: Project Supervisor.
3. Final Project Report: Project Supervisor, with the IE moderating selected reports.
4. Oral examination (at the discretion of the School): IE, one academic member, and the Dean of the School or his representative.

To gain at least a pass you will have to:

1. Obtain at least 40% overall,
2. Obtain at least 40% (i.e., 24/60) for the Final Report,
3. Obtain at least 40% (i.e., 16/40) for the cumulative score of the Initial and Interim Reports, and the oral presentation,
4. Attend the oral examination (at the discretion of the School).

8.0 Progress reports

The project is an academic exercise. It is different from a business or technical report that you write at work. It is about learning, making choices and decisions based on your judgment, analysing the data, looking for trends and evidence, and reaching conclusions based on scientific principles.

Marks are given only for what is contained in your reports, and not for work that you may have done but which is not included in the reports. Your reports must reflect a high level of learning and scholarship appropriate to an honours degree. You should show evidence of a good understanding of the principles involved, and ensure that your arguments are based on facts. Originality in the presentation will be highly regarded.

General guidelines on the content and style of the reports are given below. However, a different approach may be used for specific projects such as projects on systems and design. When in doubt, discuss the content and style with your supervisor before writing your reports.

Initial Report (Due in the 8th week)

The report should be about **1,500 words** long. Your supervisor will comment on the report and the comments will be discussed and elaborated upon in the subsequent tutorial.

In grading your report, the supervisor will look for the following:

1. References used in your study, with comments as to their relevance.
2. Evidence of your understanding of the principles underlying the project.
3. Identification of a definite topic and its relation to existing similar work.
4. Specification of the goals of the project.
5. Outline of a strategy for achieving these goals.

Throughout the report, your supervisor will look for a “critical and analytical approach” to the problem being investigated. Be careful not to lose sight of the aims and the objectives of your project. In your report, you must stick to the these stated aims and the objectives.

It is important that you include as much detail as possible in your initial report. This is to enable your supervisor to give you guidance and advice. After reviewing your initial report, your supervisor may think that it is necessary for you to revise the aims and methodology of your project. It is crucial to consider your supervisor’s advice before proceeding to the next stage.

The percentage figure given alongside each section below indicates the approximate weighting of marks given. Your initial report may be in note form and will usually be presented with three main headings:

1. *Project Definition (20%)*

This part should include:

- a. *Project objective* (the 'what' of the project): a statement of what is to be achieved, the expected outcome and possible use or value of the project. In experimental studies, this could be represented by the hypothesis that is to be tested.
- b. *Overall objective* (the 'why' of the project): why you consider it important and worthwhile. The reason can be simply "because it's there," or "to collect data which is useful in some way," or something that confounds your predictions.
- c. *Proposed approach and method* (the 'how' of the project): a statement of how the objective is to be achieved; for example, by conducting an experiment, by writing software, by conducting a survey and analysing the data, etc.

2. *Literature Review (60%)*

This section carries the most marks. The materials that you put into this section will also be an important aspect in your Final Report. This section is a critical appraisal of the literature base on which you will formulate and develop your project. You should describe how the literature and any existing work reported in this area are related to your project. It is important to show, where appropriate, how you apply the concepts and principles that you have learnt in other courses in this programme to your project.

3. *Project Plan (20%)*

This should include a chart or schedule covering the whole duration of the project. Break down the activities into smaller tasks as far as possible. Each task is to be shown with the time allocated to it. Additionally, show how each task is related to the others in the sequence of execution. Under the chart you should describe the resources required for the successful completion of the project (e.g., information or data, access to equipment and facilities). Give details on arrangements that have been reached about the use of facilities, equipment, software, etc.

Interim Report (Due in the 25th week)

The Interim Report should be about **1,500 words** long and presented in three main headings:

1. *Progress since the initial report (25%)*

This section should contain a brief statement of the following:

- a. A restatement of the project objective: has the objective changed, been modified or been developed further since the initial report? If the objective has not undergone any change or further development, state why.
- b. Your progress: a statement of what has been achieved since the initial report.
- c. Problems and successes: comment on the successes of the project so far and/or any practical problems that have arisen and how they were handled.
- d. A critical assessment of any further literature you may have read, or a reinterpretation of some of the material you presented in the first report which comes about in the light of experience.
- e. Project plan: a diagram and/or a summary of tasks to be completed in the remaining time.

2. Draft chapter on literature review and methodology (50%)

This part of the report will be used as the basis for a chapter in your Final Report. Read the notes on style and presentation in Sections 9, 10 and 11.

The draft chapter should include the theoretical background to the project and the methodology of investigation you are using. You should start with a brief discussion on the strategy that you originally intended to use. If appropriate, this should then be followed by a description of the strategy you have subsequently decided to adopt, and the reasons why this different course was chosen. Finally, you should interpret any preliminary findings at this interim stage of your project, in the light of the literature you have studied. You should compare your findings with what you have expected or against what has been reported in the literature.

3. *Final Report structure (25%)*

This section should include a proposed list of chapter headings for your Final Report, with a brief synopsis outlining the likely content of each chapter. You should also include an approximate word or page count for each chapter.

Oral presentation (In the 26th week)

The oral presentation will form part of TMA 2 of the course and will serve two purposes:

1. For you to learn the techniques of, as well as to experience, presenting a project to an audience of experts in 15–20 minutes.
2. The presentation will be an avenue for providing you with feedback. Comments will be given by the Project Supervisor during the presentation.

The distribution of marks for the oral presentation is summarised below:

a. Oral presentation	20%
b. Background knowledge	30%
c. Project methodology	30%
d. Discussion, Q and A	20%
Total	100%

Note: If you are unable to attend the oral presentation, please inform your Project Supervisor immediately.

Report submission

The Initial and Interim Reports are allocated the following assignment numbers:

Initial Report	TSN 309/TMA01
Interim Report	TSN 309/TMA02

The cut-off dates for the submission of these reports are shown in a separate timetable.

Completing your reports

Please submit all your reports in hard copy. Use A4 size paper and put your name, your student number and the appropriate assignment number at the top of every sheet.

Submitting your reports

When you have completed each report, please fill in the Report Submission form, taking particular care to enter your student number and the assignment number correctly.

It is recommended that you send each completed report, together with its Report Submission form, to the Regional Office by hand. If you decide to mail your report, please write your name and address at the back of the envelope.

Report submission policy

You are required to submit all your project reports in accordance with the deadlines given. Please submit your reports early and keep a copy of each report you submit.

If your report is posted to the Regional Office, you need to check that your report has been received by your supervisor (for instance, confirmation through telephone or email). Applications for extension without supporting documents on the grounds of postal loss will not be accepted. WOU cannot accept any responsibility for reports that are not received by your supervisor due to problems with the postal service. As a precaution, you are advised to keep a copy of each report you submit and obtain a certificate of posting from the post office when you post your report.

Submission extension application

You may apply via the Online Assignment Submission (OAS) system for a submission extension on the grounds of illness, accident, disability, bereavement or other compassionate circumstances. To submit your extension application, you have to log onto: <https://assignment.wou.edu.my/onlineExtension.asp>

Applications for extensions of up to seven days should be applied through the OAS system to the Project Supervisor who will consider valid and unexpected emergencies on an individual basis. The supervisor will also decide and advise you of the revised date for submission.

For extensions of *over seven days*, you should note the following:

1. If you require an extension of more than seven days on the grounds of illness, accident, disability, bereavement or other compassionate circumstances, you are required to apply for the extension via the OAS system. Your Course Coordinator or the Dean will consider valid and unexpected emergencies on an individual basis. The Course Coordinator or the Dean will also decide and advise you of the revised date for submission.

2. An electronic copy of supporting documents must be submitted with the application for extension of over seven (7) days to justify the claim.
3. Applications for extension should be lodged **before** or **on** the due date.
4. Applications are considered by:
 - The Course Coordinator for an extension of 8 to 14 days.
 - The Dean for an extension beyond 14 days.
5. Applications for extension without supporting documents will not be accepted.

According to WOU policy, there is no extension of the deadline for the Final Report submission.

9.0 Final Report and Oral Examination

This assessment is in two parts:

1. Your Final Report is marked by the Project Supervisor and moderated by the IE.
2. The oral examination (if required) will be conducted by the IE, one academic member of the School, and the Dean or his representative.

General requirements

The Final Report is the most important element in the course and accounts for 60% of the total marks. Your supervisor will mark your report, but you will not receive any feedback before the oral examination (if you are called to attend it).

The marking scheme below is recommended. However, internal examiners are allowed to vary the scheme to suit the nature of different projects.

	Report content	Marks
1	A critical analysis and explanation of the project and clarification of its aims.	20%
2	Integration of technological understanding in achieving the aims of the project.	25%
3	Independent reading and study, and critical use of literature in discussing the findings of the project.	25%
4	Organisation of work and of component activities of the project.	10%
5	Clarity of presentation of the report.	20%
	Total	100%

Flexibility is allowed on the length of the final report. However the average length of a normal final report would be between 7,500 and 8,500 words. Consult your supervisor if you think that your report will exceed this by a large margin. It may be that you are including unnecessary material or need to organise the report structure in a better way.

It is important that you record your successes as well as your failures. Explain the reasons for the failures and why they were not foreseen. One of the aims of the course is to teach you how to do a project. Some students may not reach a “successful” outcome, such as getting a solution to the problem or building a working model. They may nevertheless have learned as much as, if not more than, those who do. Unless you record the whole process of your project, the examiners will not know what you have learned.

Confidential material

The Award Committee cannot accept a Final Report that contains confidential material. The reason for this is that all Final Reports will be kept in the university and will be available to everyone in the university. This is normal practice for undergraduate and graduate project reports in all universities. To avoid any complications, ensure that your sources of information are not confidential. If you are in any doubt, consult your supervisor.

Acknowledgements

You are required to specify and acknowledge any support that you may have received from any source in the course of carrying out your project work. If the assistance from any source, in particular from your employers, is substantial, you should include a detailed description of the support received in an Appendix.

At the beginning of your final report you should also acknowledge any help or assistance from any other source.

Report title page and declarations

Your Final Report should be typed on A4 size plain paper. Follow the format and style of the title page given in the Appendix. The title page contains your name, student number and project title.

You are to reproduce the copyright declaration and the originality declaration given in the Appendix and bind them at the front of your report following the title page.

Submission of report

Submit two ring bound copies of your final report; one each for your supervisor and the internal examiner. You will need to keep a copy of the report for reference purposes and to prepare for the oral examination if necessary.

After the report is marked and the oral examination is taken (if you are required to take it), an original print copy of the final report (you may need to make final amendments to your report after the oral examination) is to be bound in soft covers for submission to the university. The ROs of the university will be able to show you a sample of the cover paper type and colour at a later date. You are also required to submit a copy of your report in CD-ROM format together with the final bound copy of the report.

Submit all your reports by hand to the ROs by the cut-off date shown in the timetable. **No reports will be accepted after the cut-off date.**

Structure of the final report

The structure below is given as guidance for you to write your final report. However, you are allowed to structure the report in your own way:

1. Title page
2. Abstract
3. Contents page
4. Introduction
5. Aims
6. Main text and discussion
7. Conclusions and recommendations
8. Acknowledgements
9. References
10. Appendices

The abstract

Your report must include an abstract, which is sometimes called a summary. The abstract may be as brief as 200 – 250 words and should never be more than one side of an A4 page. It should fulfil two purposes:

1. To make a person interested enough to read the whole report and to provide a general overview of the report.
2. To enable someone who has previously read the report to recall the main issues addressed by the report.

The wide range of projects available to students makes it impossible to be prescriptive about the content and style of an abstract. The abstract needs to be written to serve its purposes according to the nature of the project.

The abstract should:

1. Briefly describe the project objectives and methodology.
2. Include any necessary background information.
3. State any findings or results.

4. Highlight any major conclusions.
5. Be a “stand-alone” document, giving enough information on what the project is all about.

The abstract must be concise, self-contained and self-explanatory.

Introduction and aims

The introduction should describe the background of your project and what you expect to achieve. The description should place it in the context or show how it relates to other relevant work in the field of study. A formal statement clearly stating the aims of your work is required in this section.

Main text

The main text consists of one or more sections covering the methodology or procedure, formulation or derivation of model(s), software simulation, description of the experiment, data collection, analysis, and where applicable, an estimation of the accuracy and significance of the results.

In subdividing your sections, there are two factors to consider:

1. The coherence and logic or flow of the argument for clarity.
2. The strategy to capture the reader’s interest.

Conclusions and recommendations

The final conclusions and recommendations sum up not only your achievements, but also your failures. It is always the case that a project will raise more questions and provide leads for further investigation. A section should be written to point out possible work for future students or others to follow up on.

Oral examination

This section applies only to students who are called to attend an oral examination after their final reports have been assessed. The oral examinations will take place during the 46th week for the majority of students. You will be told later in the year where and when your oral examination will take place.

Aims of the oral examination

1. To provide an opportunity for you to demonstrate your understanding of the project by oral communication to compensate for a poorly written report.
2. To provide an opportunity for the examiners to satisfy themselves about the level and amount of work done, by allowing you an opportunity to give a detailed account of the project.
3. To provide the examiners with more information to decide the award of a suitable grade for borderline cases, which in some cases may affect the honours classification.

The oral examination

The oral examination, if necessary, will be conducted by a panel comprising of the Internal Examiner, another member of the School's academic staff, and the Dean or his representative. The examiners will want to check your knowledge of the background and underlying principles of the project. They will also look at the details of how you organised and managed your project. The examiners will ask questions arising from the findings in your project. Such questions are usually open-ended and will give you the opportunity to demonstrate your overall grasp of the topic. The examiners will not be seeking to trap you or to cause you embarrassment; instead, they will be trying to give you an opportunity to demonstrate the soundness of your project's conclusions.

Examination policy

There is no written examination for this course. However, you will need to attend the oral presentation, and if required, an oral examination. You are required to attend the scheduled presentation and the oral examination (if necessary) at the appointed time and place.

Students who are experiencing illness or a personal crisis and are unable to sit for any examination have to state in a written letter addressed to the Registrar the reasons for their absence. The letter must be supported by valid documents and must be submitted within seven (7) days from the date of the examination and will be considered by the University on its merits and on a case-by-case basis.

If you miss a scheduled examination without approval, you will be awarded zero marks for the examination.

10.0 Writing Style, Presentation and Handling of Data

This section is intended as a guide to help you write your final report. You must realise that a project can be in various forms; for example a theoretical study, a computer simulation, design and hardware implementation, measurement and data collection, etc. Each of these will need its own style of report writing.

Individuality is reflected in the style of writing. Here, the guidelines are not meant to force everyone to adopt a certain writing style. They are merely to affirm that a piece of good writing is easily recognisable in its clarity, conciseness and ordered presentation. Above all, remember that your report should be addressed to a general but informed reader. It should be written so that other students will have sufficient detail to continue with the work.

Visual presentation

Appearance is important.

1. Use A4 size paper and leave at least 40 mm for the left hand margin and about 25 mm for the right hand margin. Also leave about 40 mm at the top and 25 mm at the bottom of each sheet. These generous margins will help when photocopying the report.
2. You are advised to work in SI units. Use the correct symbols and prefixes. The same applies to mathematical and scientific symbols. Pay attention to the symbols when proofreading your report.
3. Number each sheet at the top. As you write, make cross-references by section rather than by pages. Page numbers may change later. If you wish to refer to the page numbers in the text, do so only after you have the final version of the report.
4. Chapters, sections and subsections should be numbered for reference, but avoid cumbersome sub-sub-section numbering such as 4.2.3.6. Mixed labelling can be useful, for instance 4.2(c)(vi). However, labelling down to such a detailed level is only practised in a closely argued or legalistic document, such as a contract. To keep the contents list short, include only numbered headings. There is probably no need to exceed two digit numbers, such as 4.2 or 3.4.
5. Headings should be used at the beginning of chapters and wherever else necessary. Carefully selected headings make the report clearer and will avoid confusing the reader. They should be distinguished by a change of font or size, or be underlined in the report.

Information formats

1. Tables should be used to present information concisely where graphs or histograms are not appropriate. In setting out tables, arrange the data so that there are more rows than columns and use a minimum of horizontal lines.

Table headings should follow the chapter number (e.g., in Chapter 1, Table 1.1, 1.2, 1.3 ...) in the order in which they are mentioned. They can then be referred to in the text by number only (e.g., Table 1.1).

Place the tables in the text near to where they are first referred to. If you use a very large number of tables, they may be more conveniently collected at the end of the report.

2. Equations should be numbered by section (e.g., in Section 2, Equation 2.3, 2.7, ...). This ensures that if one is deleted or if you need to refer to an equation that you have not previously numbered, only those in that particular section need to be re-numbered. Keep the number to the right margin of the page. Check all references to equations in the text when editing your final draft.
3. Graphs, histograms, drawings, diagrams and photographs should all be referred to as figures: Figure 1.1, Figure 1.2, and so on.

If the size of the figures is small, you may put two on a page. Insert a caption for each figure. Place the figures in the text next to where they are first mentioned.

Keep the labelling inside the figures to a minimum using letters, abbreviations and symbols; avoid phrases. Use the figure caption to explain the details. For example, a number of curves on a graph may be labelled A, B, C and then each can be identified in the caption.

4. Use black ink to draw and label figures, as this colour produces the best photocopies. Avoid the use of colours to differentiate between curves or parts of a diagram. Colours reproduce as shades of grey in photocopies.

If you have photographs in your report, you will need a set for each copy of your report. Photographs do not photocopy well.

Check all references to figures in the text and any information you quote from within the details of the figure.

Use of references

1. Give the reference in the text for any work from which you have quoted results, taken tables, reproduced figures, or used any information.
2. You can quote a reference by number, such as Jones¹ or refer to the publication by name of the author(s) and year of publication, for example, “Jones and Brown (1978)” or “... it was found (Jones and Brown 1978)”.
3. Where there are more than two authors, use “et al.” in the text; e.g., “Jones et al. (1978)”.
4. When the same author(s) has more than one publication in the same year, use a, b, c, etc. to identify each (see example below).
5. At the end of your report, give the list of references, either in numerical order if you used numbered references, or in alphabetical order of the first authors’ names as follows:

Haughton, P M (1977) ‘Physics and the ear: an outline of the mechanisms of hearing,’ *Physics Education*, vol. 12 July: 313–317.

Hope, A (1978a) ‘Video recording: the battle behind the scenes’, *New Scientist*, vol. 78, no. 1097 (6 April): 8–10.

Hope, A (1978b) ‘100 years of microphones’, *New Scientist*, vol. 78, no. 1102 (11 May): 378–379.

Surrey, A J, and Bromley, A J (1973) ‘Energy resources’ in Cole, H.S.H. et al. (eds) *Thinking about the future*, Brighton: Chatto and Windus/Sussex University Press, 90–107.

Taylor, R (1970) *Noise*, London: Penguin.

Walters, A P (1976) *Piano Mechanics*, University of Nottingham: BSc Project Report (unpublished).

6. The main point to consider in giving a reference list is that the work should be easily identifiable if the reader wishes to look it up.

All the above references give the name(s) of the author(s), their initials and the year of publication. References to periodicals should include the title of the periodical (underlined or italicised), the volume number, the issue number (where there is one) or the date of issue (particularly

for a weekly periodical), the title of the article and the page number of the first and last pages. Book references should include the title of the book (underlined or italicised) and the name of the publisher and the place of publication. Give the title of any reports you refer to, and a sentence explaining their source if they are not published by a recognised publisher.

7. You must acknowledge all your sources of information, whether publications or people. You will be penalised if you try to claim something that you have taken for somewhere as your own work. Keeping silent on the source of your idea is plagiarism.
8. We suggest that you make notes on the references as you read them or take material from them, using the format style given above. Producing a reference list at the end of your project can be tedious and result in inaccuracies. You may have returned a paper to the library, and will have to waste time looking up references.
9. Appendices, acknowledgements and references are not normally given a section number, but if you include more than one appendix, give each a number of its own (e.g., Appendix 1: Electrical Specification).

Computer programs

An increasing number of projects involve some software development. In some projects, software is actually the whole point of the project. You will need to be aware of this before you take on a project. On the other hand you may only need to use a commercially available program or a program you or another student have either written or adapted.

Simple programming and data manipulation are considered as tools you use in your project. The details can often clutter up the text in your report. If the software you have worked on is considered to be more than a minor part of the project, you may include a description of the procedure in the report text and put the details of the software in an appendix. This will allow you to write your report more clearly.

If, however you have based your work on a novel mathematical model, you should describe this in the text and explain the code in detail.

Very often, students get engrossed in computing during their project, and they equate the time spent on computing with actual study time. You should not spend too much time on computing unless the project is specifically on computing or software development. Be cautious of spending an excessive amount of time at the computer.

11.0 Examples of Layout Style

The basic structure of a final report should follow that described in Section 9. However, most project final reports will contain substantial differences to that described in Section 9. The course team feels that it would be helpful to include in this section some examples of good practice. In addition to showing examples on specific aspects of the content, they also give you the opportunity to see some of the different styles of layout that might be used.

These examples are taken from different disciplines, so you should look at them as something that you could follow, rather than something that you must follow. When looking at the examples, you should concern yourself only with the formatting styles and ignore the contents which are not relevant to your project.

Example 1

The abstract should be brief. An abstract usually includes a brief and concise description of the research, methodology, results or major outcomes, recommendations and conclusions drawn from the project.

Abstract

The main objective of this research is to analyse the internal behaviour of Internet web pages with regard to web link design, web link structural organisation, web link accessibility and web surfing efficiency, and to propose solution models for improving the quality of WWW and for enhancing web security against malware.

An independent set of links in a web link network structure is analysed and a new method is proposed. If the links in an independent set satisfy the equivalence relation, an equivalence class is formed. Considering the vagueness of link accessibility, fuzzy c-mean algorithm is utilised to classify the web links into five linguistic accessibility clusters. Fuzzy equivalence classes are identified if the links satisfy fuzzy equivalence relation. The formation of a fuzzy equivalence class implies that direct accessibility of its elements is consistent and strong. Multiple link structures are analysed and their accessibility functions are derived by using both probabilistic and fuzzy concepts. The importance of the subsets of links in each of these structures is evaluated by using Birnbaum's measure and their implicit features are investigated. State space models for partial accessibility of subsets of links are also developed by using both probabilistic and fuzzy concepts.

A Monte Carlo simulation model is developed by assuming an exponentially decreasing losing rate. Identifying the presence of minimal cut sets on a web link network is then considered to enhance the reliability and security of the web site. To impose link level security on different authorised users, a link level access control mechanism (LiBAC) is proposed to categorise and limit the users for accessing the web links by providing partial access states. New navigation models, termed as

pre-order and Hamiltonian models are proposed for naïve users to improve their surfing efficiency. Fuzzy distance measure is utilised to identify the optimal path that leads to a pre-defined target page.

Example 2a

Contents

Abstract

Frontispiece

Synopsis

Chapter 1	Introduction, Aims
Chapter 2	Web Accessibility Issues — A Review
Chapter 3	Similar Class Approach for Web Link Classification
Chapter 4	Web Link Structural Accessibility Analysis
Chapter 5	Proposed Web Access Control Mechanisms
Chapter 6	Conclusions, Future Research, Contributions

Recommendations

Acknowledgements

References

Appendices

I	Web User Access Behaviour
II	Web Accessibility Initiative (WAI)
III	Web Content Accessibility Guidelines 1.0
IV	Future Web Accessibility

*Example 2b***Contents****1 Introduction**

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- 1.2 Project objective
- 1.3 Methodology

2 Literature survey

- 2.1 Review of Web Application Technology
- 2.2 World-Wide-Web, Semantic Tools
- 2.3 Semantic Web

3 Web Interactive Multimedia Content

- 3.1 Multimedia Streaming
- 3.2 Content Management System Concepts
- 3.3 Methodology for the implementation of a fuzzy controller
- 3.4 The Development of Content Management Technology

4 Design of the Multimedia Content Management System

- 4.1 Design System of the MCMS
- 4.2 System Architecture of the MCMS
- 4.3 Software Architecture and Components of the MCMS

5 Implementation of the MCMS News Kiosk

- 5.1 Workflow Management System
- 5.2 The Interactive Multimedia Content (IMC) Authoring System
- 5.3 The Interactive Multimedia Content Viewing System

5.4 Web Publishing and Data Management for MCMS

5.5 Client Access to MCMS News Kiosk

5.6 Prototype Survey and Result

6 Conclusions and recommendations

6.1 Conclusions

6.2 Recommendations and Future Works

Acknowledgements

Appendices

Example 3

1 Introduction

1.1 Background to the project

Ontology has been recognised as the key technology in shaping and exploiting information for the effective management of knowledge and for the evolution of the Semantic Web and its application. This project addresses the problem of overcoming the complexity of understanding ontologies. It would help clear some of the hurdles that are presently in the way of the wider acceptance of Semantic Web technology.

1.2 Project objective

This project aims to provide users with a tool that will assist them in the process of gaining a better grasp and understanding of a given ontology. It is important that the Semantic Web is not only accessible to everyone, but that it is also easily shared and reused. Multiple ontologies may exist for the same domain, where there are different conceptualisations to represent the domain information. Users need to understand how each of these ontologies is structured for it to be reused for developing other separate or similar ontologies, or to introduce more concepts that would enhance the ontology.

1.3 Methodology

In this research the following methodology is followed:

1. A survey is done to explore the available resources to build and analyse ontologies.
2. A literature survey is conducted to investigate the techniques used to represent the ontology components.
3. The advantages and disadvantages associated with the available extraction tool are identified.
4. An object-oriented problem analysis and design methodology is carried out to identify the entities, functions and components that would be encapsulated in the ontology representation tool.
5. A detailed design using the Unified Modelling Language (UML) is presented and documented.
6. A prototype is implemented.
7. Testing and investigation of the prototype is carried out.

1.4 The literature search

This section concentrates on the components that form the Semantic Web and how each plays its role in it. **Figure 1.4** below shows the many components that come together to form the technology of the Semantic Web.

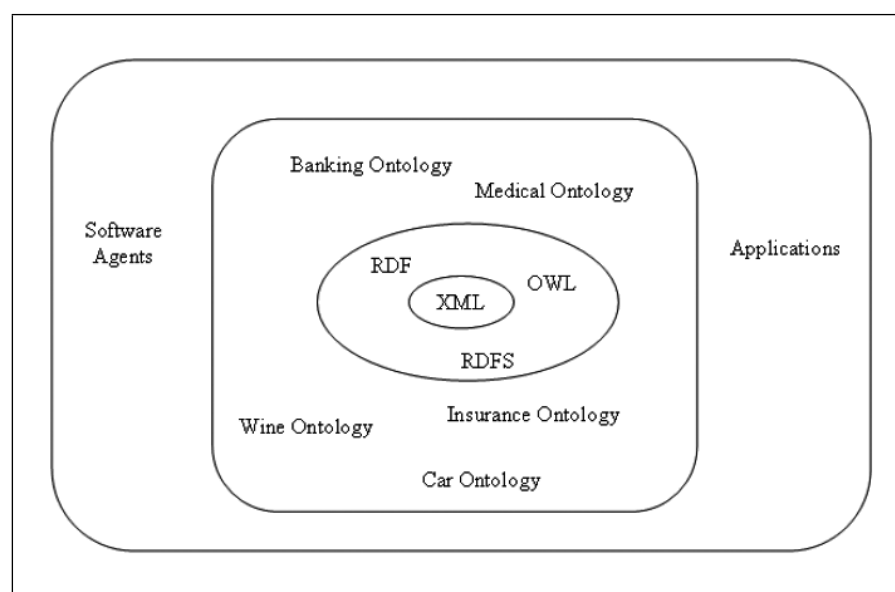


Figure 1.4 A general view of the Semantic Web

The Semantic Web lies at the heart of Tim Berners-Lee’s vision for the future of the World Wide Web. As part of the evolution towards a Semantic Web, Web resources will have to be annotated with a significant amount of markup that can be reliably processed by computational agents. Many believe that this markup will largely consist of terms from ontologies, in which conceptualisations of domains have been specified in the form of hierarchically structured sets of uniquely named and defined terms and their relationships.

The Semantic Web works toward providing an environment where information may be given explicit meaning, in order for it to be automatically processed by machines and to be integrated seamlessly. It is intended to be a way of representing the semantics of documents and enabling these semantics to be used in web applications and intelligent agents.

Example 4

Tables, Formulae and Diagrams

Web Links	Triples (millions)	Interlinks (thousands)	Dump download	SPARQL endpoint
BBC John Peel www.bbc.co.uk/radio1/johnpeel/	0.27	2.1		
DBLP www.informatik.uni-trier.de/~ley/db/	28	0		Yes
Mu www.musicbrainz.org	50	0		
Ontoworld www.semanticweb.org	0.06	0.1	Yes	Yes
W3C Worldnet www.w3.org/TR/wordnet-rdf/	0.71	0	Yes	

Table 3.1 Linking Open Data dataset as a glance

In order to find metrics for the Semantic Web we examine its properties by inducing from the LOD dataset analysis. One possible dimension to assess the size of a system like the Semantic Web is the data dimension.

The pure number of triples does not really tell much about the size of the Semantic Web. Analysing the links between resources exhibits further characteristics. The LOD dataset can roughly be partitioned into two distinct types of datasets, namely (i) single-point-of-access datasets, such as DBpedia or Geonames, and (ii) distributed datasets (e.g. the FOAF-o-sphere or SIOC-land). This distinction is significant regarding the access of the data in terms of performance and scalability is illustrated in Table 3.1

As not all LOD datasets are available as dumps, it became obvious that additional crawling processes were necessary for the analysis. The available and the self-crawled dumps together were loaded into the relational database, where the analysis took place using SQL. Additionally, we inspected the descriptions provided by the LOD dataset providers in order to identify parts of the dataset which are relevant for interlinking to other datasets. Where feasible, we also used the available SPARQL-endpoints.

3.1 Statistical Ranking Web Semantics

When investigating the entities in an association, it is apparent that some entities have more incoming and outgoing relationships than others. Somewhat similar to Kleinberg's Web page ranking algorithm, as well as the PageRank algorithm used by Google, our approach takes into consideration the number incoming and outgoing relationships of entities. In our approach, we view the number of incoming and outgoing edges of an entity as its popularity.

In some queries, associations with entities that have a high popularity may be more relevant. These entities can be thought of as hotspots in the knowledge base. For example, authors with many publications would have high popularity. In certain queries, associations that pass through these hotspots could be considered very relevant. In other queries, one may want to rank very popular entities lower. For example, entities of type 'Country' may have an extremely high number of incoming and outgoing relationships. Similar to our assessment of rarity, we define the popularity of an association in terms of the popularity of its entities as

$$p_i = \frac{|pop_{e_i}|}{\max_{1 \leq j \leq n} (|pop_{e_j}|)} \text{ where } typeOf(e_i) = typeOf(e_j)$$

3.2 Overall Ranking Criterion

In the above sections, we have defined various association ranking criteria. We will now define the overall association rank, using these criteria as

$$W_A = k_1 \times C_A + k_2 \times S_A + k_3 \times T_A + k_4 \times R_A + k_5 \times P_A + k_6 \times L_A,$$

where k_i ($1 \leq i \leq 6$) add up to 1.0 and is intended to allow fine-tuning of the ranking criteria (e.g., popularity can be given more weight than association length). This provides a flexible, query dependant ranking approach to assess the overall relevance of associations.

Example 5

Structure and style within the report

Chapter Four

Design of the Multimedia Content Management System

4.1 Design System of the MCMS

A Multimedia Content Management System (MCMS) is proposed to support the creation, integration and management of Synchronous Multimedia Integration Language-based (SMIL) interactive multimedia news content for the News Kiosk. The MCMS is built as a Web application, making the authoring process for the interactive multimedia news possible on any computer with an Internet connection. It is built on top of the UNIX platform, RedHat CCM framework to take advantage of the website management services offered by RedHat CCM. The MCMS is coded using Java 2 Enterprise Edition (J2EE) so that it is truly platform independent.

The MCMS supports interactive multimedia news repurposing through the use of SMIL scripting. Rather than extracting content, then re-encoding and storing it as a separate file for use in other shows, SMIL scripting is used in the MCMS to describe when to start and when to stop, to obtain the desired content. This eliminates the problem of content redundancy in media storage.

4.2 System Architecture of the MCMS

The MCMS uses template-based authoring which improves on the complicated, tedious and time consuming authoring process for interactive news content. The conventional way of creating interactive multimedia news using off-the-shelf authoring tools such as Flash, will require the author to do timeline programming, action scripting and so on. However, using the MCMS approach, the content author needs only to choose a template, fill in the step-by-step, guided Web forms and send the information back to the MCMS. The transformation engine built within the MCMS will take the information submitted by the content author and generate the desired interactive multimedia news. This simplification of the authoring process minimises the technological shortfall faced by non-professional multimedia composing workers such as reporters, journalists, publishers and managers.

*Example 6***6 Conclusions and Recommendations****6.1 Conclusions**

Next generation technologies that facilitate getting actionable knowledge and information from semantic metadata extracted from Web documents, the deep Web and large enterprise repositories are emerging. Through our past and ongoing work in metadata extraction, as well as the definition and discovering for complex relationships on the Semantic Web, which we call Semantic Associations, we see the need for new ranking techniques to assess the relevance of these associations due to the large number of results from queries. Since Semantic Associations are based on metadata extracted from heterogeneous documents and a set of potentially complex relationships between these metadata, we have discovered that there is no one way to measure their relevance. Thus, we have defined a flexible, query dependant approach for automatically analyzing and relevantly ranking the resulting associations. Additionally, through statistical evaluation of the ranking scheme, we have found our ranking scheme to be promising in capturing the user's interest and rank results in a relevant fashion.

6.2 Recommendations

Based on a syntactic and semantic analysis of the LOD dataset we observed that the analysis are derived for the entire Semantic Web. We have identified two different types of datasets, namely singlepoint-of-access datasets (such as DBpedia), and distributed datasets (e.g. the FOAF-o-sphere). At least for the single-point-of-access datasets it seems that automatic interlinking yields a high number of semantic links, however of rather shallow quality. Our finding was that not only the number of triples is relevant, but also how the datasets both internally and externally are interlinked. Based on this observation we will further research into other types of Semantic Web data and propose a metric for gauging it, based on the quality and quantity of the Semantic links. As the Web and its usage continue to grow, the internet will be filled up with domains and web links. The adaptations and investigations on web metrics and measurements will be further analyzed so that the various Web phenomena are being studied.

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12.0 Appendix

Title page

Project title

Student name

Student number

**Project report submitted as part fulfilment for the degree of
Bachelor of Technology (Honours) in Computer Systems and Networks**



**School of Science and Technology
Wawasan Open University**

Month and year of submission

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