Undergraduate Projects

Literature Reviews

Aims

- Provide a clear explanation of why a literature review is included in an academic project.
- Present guidelines on how to carry out a literature search.

Learning Outcomes

At the end of the lecture, students should:

- Be able to plan and carry out a literature search.
- Be able to describe a literature review for an undergraduate computing project.
- Be able to explain the relevance of a literature review to an academic project.

Part One

The Literature Review

Literature Review

- Carry out search of relevant literature and provide a *critical review* of the material.
- Provide an understanding of the topic area - problem domain/technology - in terms of established theory and practice.
- Demonstrate that you can apply the knowledge that you have been exposed to.
- Reuse tried and tested ideas, methods and techniques.

Purpose

- Help you to understand and set bounds for the problem that you are tackling.
- Identify relevant concepts, methods, techniques and technologies.
- Identify examples of good practice in software engineering.
- Identify new approaches/technologies.
- Link other people's work with your own.

Importance

- You will see evidence of a literature review in almost all academic books and journal articles, in the form of quotations, footnotes, references and citations.
- This is an important part of your project and one that you must address fully in your project report if you wish to be awarded a good overall project mark.

Depth of Treatment

- ***You will not*** at undergraduate level, generally be expected to produce a definitive account of the state of research in your selected topic area.
- ***You will*** need to provide evidence that you have read a certain amount of relevant literature, and that you have some awareness of the current state of knowledge on the subject.

Critical Reading

- Does not take what is written at face value.
- Goes beyond mere description by offering *reasoned* opinions and making a personal response to what has been written.
- Relates different writings to each other:
  - strengths and weaknesses of each
  - works that agree or disagree

(Blaxter *e*

Writing

- Provide 'a coherent argument that leads to the description of a proposed work' (Rudestam & Newton, 1992).
- In an undergraduate computing development project this is not always possible.
- The literature review should address an area directly relevant to your project.
- References should be used to support your arguments.

The Use of References

- To justify and support your arguments:
  - analyse what you have read
  - summarise coherently and logically
- To allow you to compare points of view:
  - find references that disagree
- To express ideas better than you could have done.
- To demonstrate your familiarity with your area of work.

(Blaxter *et al*

The Abuse of References

- Trying to impress your readers with the scope of your reading.
- Littering your writing with names and quotations.
- Replacing the need for you to express your own thoughts.

(Blaxter *et al.*,

Presenting the Results

1. As a single chapter.
2. As a series of chapters.
3. Subsumed within the report as various issues are tackled.

- For an undergraduate project, approaches 1 & 3 are the most common.

(Saunders *et al*,

Do Not

- Simply list all the books and papers that you have read (Bell, 1999).
- Write a short paragraph or page on each article or book in turn, merely reporting on their content (Haywood & Wragg, 1982).
- Quote extensively.
- Give opinions unsupported by the literature.
- Fail to link the literature review to *your* project.

Research-Based Projects

- Normally require a significant amount of investigative work.
- Need to look at the work of others and identify concepts, methods, models and strategies that are relevant to your own work.
- The literature review is therefore of considerable importance to such projects.
- Provides a framework and direction for the project.

Development Projects

- A development project should consist of a technical build *and* a relevant investigation.
- You should include a critical evaluation of the investigative work.
- Critical evaluation emphasises the distinction between the academic quality of your work, and technical ability alone.

Part Two

The Literature Search

What is a Literature Search?

'A systematic gathering of published information relating to a subject'

Published Material

- Textbooks
  - basic principles, facts, and theories with examples
- Journals
  - contain most recent material
  - can contain papers with content that would not normally warrant a complete book
  - give an overview of the current state of a subject
- Reports
- Conference literature
- Official publications

Planning

- A systematic search needs to be planned
  - What do you need in the way of books, papers etc.?
  - Where will you look for them
    - which libraries?
    - what might web sites provide?
- Set a limit to the scope of your searching
  - second project deliverable provides a target date for completion
- Allow for some material to be acquired later in the project
  - you can add to your literature review at any time during the project

Recording References

- Record manually or electronically:
  - the complete bibliographic reference
  - the location where reference was found
  - the date when located
  - any further details concerning the source of the reference that might be helpful in the future

Remembering what you have read

- It will be necessary to devise a system of note-taking or recording which allows you to record in a manageable way, the key elements from your sources that you might wish to use:
  - use index cards (available from W.H. Smiths for example) or software for
  - referencing and cross-referencing publications
  - indexing quotes
  - highlighting, underlining or making notes on copies of articles etc.
  - make notes that explain the contribution of what you have read: ideas etc

How to read for research

- Skimming
  - rapid reading to gain a general impression of the material
  - no need to read every word
  - ‘dip into’ chapters that appear interesting or useful
- Reflective
  - read carefully to allow time to analyse and reflect
  - understand underlying concepts presented
  - compare with other works
- Scanning
  - Skipping through quickly, looking for something
  - check index for specific item

Example Book Classifications

Computing Science	005
Business Studies	656
Decision Making / Information Management	658.403
Electronics / Communications Engineering	621.38
Mathematics	510
Report Writing	808.066
Society & I.T.	301.4833

Electronic Information Searches

- Specialist information resources now available from on-line services:
  - On-line Public Access Catalogues (OPAC).
  - Other institutions and organisations.
  - Searching on the Internet.

Abstracts and Articles

- *Computer Select*: a CD-ROM containing complete articles published in various computer journals
- *Computer Abstracts*: a catalogue of abstracts and details of articles

http://www.anbar.c

Bath Information Data Services (BIDS)

- A database containing up-to-date abstracts and article details

http://www.bids.ac

OPACs

- Perform searches electronically for material held in the University of Greenwich library.
- Can also access similar services at other institutions:

British Library http://opac97.bl.uk

Useful Links

National Information Services and Systems

http://www.niss.ac.uk/lis/opacs.html

Library of Congress

http://lcweb.loc.gov/z3950/gateway.html

Computing Organisations

Association of Computing Machinery (ACM)

http://www.acm.org

British Computer Society (BCS)

http://www.bcs.org.uk

Institute for the Management of Information Systems (IMIS)

http://www.imis.org.uk

University of Greenwich Library

- Visit the library web site for information on
  - how to search for information
  - how to give bibliographic references
  - and so on.

www.gre.ac.uk/directory/library/guides

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Copyright and Unpublished Material

Summary

- Demonstrate that you have a more than superficial understanding of your subject area.
- Demonstrate that you are able to read about, understand, and apply relevant concepts, methods and techniques.
- Show critical evaluation in your analysis and summary of the literature that you have read.