

Research Methods
comp4809/7809
Week 4

Questions

Lecture 4 Tools

- Tools for software engineering
- Tools for writing
- Tools for project management

Tools

- What tools do you use already?
- What will you use this year?

1. Integrated Development Environment (IDE)

- eg visual studio, eclipse and netbeans
- Typically consists of:
 - editor
 - debugger
 - build environment
 - access to help system
- If you are not using an IDE, then you need to consider other options;
 - editor with syntax highlighting: eg emacs, vim, gvim
 - build environment: eg make, ant,
 - access to help on language and APIs (application programming interfaces): java.sun.com

Tools for building software

- Programming language
 - API documentation
- Editor
- Build environment
- Debugger
- Revision control

- IDE?

Programming language

- You've probably already chosen one, but...
 - C/C++
 - Java
 - C#
 - Python
 - Perl
 - Ruby
 - Boo
 - ...
- API docs for your chosen language

Editor

- Something with the basic features you need:
 - syntax highlighting
 - code folding
 - make/ant integration?
- Some choices:
 - emacs, vim, gvim, nedit, ultraedit, ...

Build environment

- Your project probably won't be *that* large, but it never hurts to have some control over the build
 - make, ant
 - whatever your IDE gives you
- Obviously not an issue in some languages

Debuggers

- You won't need one of these... hopefully
- Most decent debuggers either cost money, are hard to use, or are integrated into an IDE

2. Managing revision control

- A revision control system keeps track of changes to files and directories over time.
- It can be used for any files, including source code, documents and binary files.
- It gives you the freedom to make large changes as you can always roll back to an earlier version.
- Useful features of revision control includes:
 - seeing the state of a file on particular date;
 - comparing different versions of a file;
 - rolling back to earlier versions of a file;
 - provides support for multiple developers working on a single file
- Examples include
 - CVS (concurrent versioning system), is the industry standard.
 - subversion is intended as the successor to cvs.
 - Visual source safe is a microsoft product supported by the visual studio IDE.
- Many IDEs and editors include support for revision control.

Revision control

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Revision control

- Useful features of revision control includes:
 - seeing the state of a file on particular date;
 - comparing different versions of a file;
 - rolling back to earlier versions of a file;
 - provides support for multiple developers working on a single file
- Examples include
 - CVS, Subversion, Arch, Visual source safe

Announcements

- Subversion information is now available at:
<http://www.itee.uq.edu.au/~comp4809/wiki/index.php/Subversion>

Integrated Development Environment (IDE)

- Visual Studio, Eclipse, Netbeans, Sharpdevelop, ...
- Typically consists of:
 - editor
 - debugger
 - build environment
 - possibly also API documentation browsing, revision control integration, ...

Tools for writing

- Whatever you're writing in
 - Word, Wordperfect, LaTeX, Docbook, HTML
- Whatever you're managing your bibliography with
 - Endnote, BibTeX
- Revision control
 - You *were* going to version your thesis, weren't you?

Tools for project management

- Project planning software
- Backup

- All that other stuff
 - email, other communication mechanisms, note-taking software, etc.

Project planning software

- Depends on your project, and how you work. Could be useful, could be overkill.
 - MS Project, Planner, ...

3. Backup strategy

- All work should be backed up on another physical machine preferably every 24 hours.
- ITEE administered servers are backed up nightly.
- Files located at home or on notebook computers can be synchronized manually, or preferably using a tool like **unison** or **rsync**. Both of these synchronise over ssh and its much quicker than copying all files every day.

Backup

- Backup periodically to the computer you're working on
- Backup to home
- Backup to personal storage
- Backup to a personal hard copy
- Backup to the ITEE servers

Backup

- All work should be backed up on *another physical machine* every 24 hours.
 - ITEE administered servers are backed up nightly.
- Files located at home or on notebook computers can be synchronized manually, or preferably using a tool
 - Find software that suits you to use
 - Unison, rsync, ...
 - Both of these synchronise over SSH and its much quicker than copying all files every day.

A Tale of Two theses

Case A.

Honours student, all work was on the laptop in the car ...

Case B.

PhD student, work carefully backed up next to computer at home ...

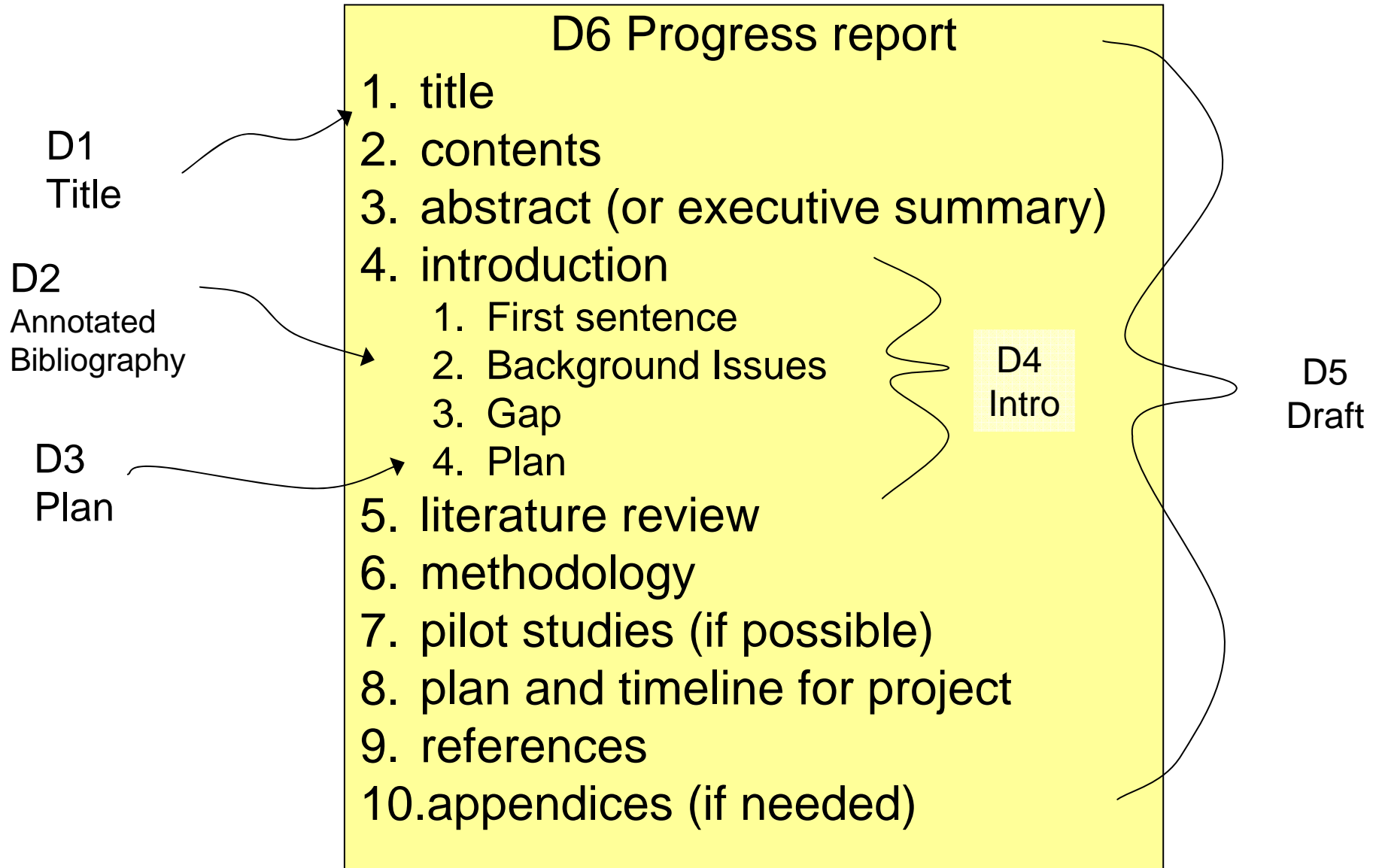
Attendance sheet

Break

Move your focus to writing and making progress

- Week 1: Getting started.
- Week 2: Find literature and methods
- Week 3: Understand the issues, build methods skills
- Weeks 4-5: Start writing, make progress
- Week 6: Completing the progress report

How the Deliverables fit together



D4. Statement of research question and project introduction using Swales format

Task

1. State your name, student number, supervisor and title of your project.
- 2. State your research question or thesis-of-the-thesis (25-200 words).**
- 3. Project introduction (800-1000 words) providing a brief description for each of the sections below (these elaborate on the headings of the Swales format discussed in class in week 3).**
4. State the word count.
5. Show your description to your supervisor and get their signature

Introductions a la Swales[^]

- **Move 1. Establish field**
 - Assert centrality
 - State current knowledge
- **Move 2. Summarise previous research**
 - Outline issues in literature
- **Move 3. Prepare for present research**
 - Indicate a gap
 - Raise a question
- **Move 4. Introduce present research**
 - State purpose
 - Outline present research

[^] Swales is a professor of literature who does “genre analysis”. i.e. he analyses common structures for different types of writing.

Exercise: First sentence

Write out the first sentence of
your thesis.

Swap with the person next to
you.

Try to predict what the thesis will
be about from the first sentence.

Exercise: Thesis of the thesis

Imagine you are at the end of your project, explaining the outcomes.

What will you claim is the contribution of the project?

Exercise: The gap

What's the gap that your project addresses?

D5 Draft
D6 Polished

Project progress report outline

<Project title>

Work in progress paper

<Name>

<date>

Contents

1. Project goals and relevance

Introduction

Goals of this project

2. Literature review

3. Summary of work

4. Project plan

Time scale (table of tasks)

Resource requirements

Techniques and processes

Expected outcomes

References

Project progress report example

**Thesis Progress Report:
Secure Distributed File Transfer
<student name>
<date>**

Contents

1 Project Definition

- 1.1 Project Overview
- 1.2 Project Scope
- 1.3 Intended Applications

2 Project Background

- 2.1 What is Swarming?
- 2.2 Why is swarming the answer?
 - 2.2.1 Round robin DNS
 - 2.2.2 Akamai
 - 2.2.3 Multicasting
 - 2.2.4 Conclusion
- 2.3 The pros and cons of the different topologies
 - 2.3.1 Speed
 - 2.3.2 Reliability and Redundancy
 - 2.3.3 Fairness
 - 2.3.4 Scalability
 - 2.3.5 Security
 - 2.3.6 Conclusion

3 Project Plan

- 3.1 Research
- 3.2 Implementation
- 3.3 Testing
- 3.4 Milestones and Due Dates

References

A Tale of Two Articles

Case A.

- Five journal rejections

Case B.

- Seven drafts – no rejections

From the mark sheet

Rationale:

- Each student must write a progress report which clearly defines the thesis topic, presents a review of relevant background material and an assessment of the impact of previous work on the current project. Importantly, the progress report should state the purpose, aims, coverage and relevance of the project and a project plan for its completion. All background and related material should be appropriately referenced and appear in a bibliography. The assessment also includes initiatives and abilities shown by the student in preparing the progress report, in particular initiative, creativity and problem solving skills.

Delivery:

- There is no set format or length of the progress report, and this should be discussed with the thesis supervisor. Using the format of the final thesis will assist in the integration of the material from the progress report into the final thesis. The length of actual text (excluding title pages, tables of content, etc) is usually around 15 pages. The progress report should be submitted electronically as directed to the submit website in week 7 of the first semester of enrolment, or week 4 if completing in one semester. If requested by the supervisor, a printed copy should also be handed in directly to the supervisor. The progress report will be marked by the supervisor against the progress report marking criteria.

Attributes:

- This assessment component prompts problem identification and thoughts of possible approaches to solving the problem. The assessment component tests critical reading (background literature), scientific writing and planning skills. The component demands and nurtures an ability to take direction but to also provide additional creative input, and an ability to assume leadership and demonstrate initiative. The component involves library/literature search.

Details

Topic, goal and relevance (25%): A clear definition of the topic, goals and relevance will leave the reader with no doubt about the intended coverage and contribution of the thesis. The definitions should include a project outline and clear statement of purpose. The supervisor also indicates the degree of student initiative in identifying the topic, goal and relevance.

Review of background and related work (25%): Background material for the thesis will most likely include a review of the literature in the area of the thesis, perhaps material from texts and previous theses that cover the background theory, and a review of prior art where applicable. This review should not only help the reader understand the rest of the document, but should illustrate to the reader a mastery of the material in the topic area, demonstrated by appropriate depth and coverage of material reviewed, and by the successful comparison and discussion of the different material presented. The supervisor also indicates the degree of independence by which the relevant background is identified and mastered. Indirectly, the ability of the student to find the relevant literature is tested.

Project plan (25%): The project plan should consist of a well justified, comprehensive list of logically ordered tasks with logical milestones – each clearly relating to the project aims. Progress made so far should be articulated in relation to the plan. Each task should be assigned expected resource requirements (if any) and durations. The supervisor indicates demonstrated problem solving skills – how readily the student engages with problems, how well the student analyses, breaks down, makes predictions about problems and their solutions. The supervisor indicates demonstrated creativity and self-reliance in identifying the project plan.

Presentation (25%): The document should be well structured and easy to read. The presentation needs to be succinct and concise, without spelling mistakes or errors of grammar. The report must demonstrate appropriate referencing to a correctly formatted bibliography.

Announcements

- ...

There is perfection in timing not just in doing the work.