



How to write a project report

Mon Oct 31 2011 14:15-16:00



NTNU – Trondheim
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Science and Technology

Outline

- 14:15-15:00 Research and use of references [Lill]
- 15:15-16:00 Project report writing [Laurent]
 - Motivation
 - Writing the report
 - Structure
 - Writing process
 - Tools
 - Hints

Research and use of references

Lill Kristiansen, item

Research vs text book vs journalism

- In a text book (lærebok):
 - Often only pointers to further reading is given
- Journalism
 - A journalist may write a fact box stating: Article is based on sources a, b and c
- In research detailed references are required.
 - Every non-trivial statement shall have a source
 - Study journal papers to see how

Why references?

- Show the *knowledge of former work* and that you are able to *build on this*
 - Do not reinvent the wheel!
 - This imply some chapter in your report called 'theory' / 'existing technology' / 'related work' (or similar)
- Document your own work (both design, implementation and theory / analysis), so that your work is a base for others to build on
 - This includes also to document what you have read from several sources, and what you have syntesized from those

Precise wording!

Compare to chemistry lab.

- Do NOT write:
 - I mixed white powder in lukewarm water
- Write precisely:
 - I mixed 10mg salt (NaCl) in 1l of water at 40 oC. Stirred for 1 min.
- Do NOT write
 - Software was given by the company
- BUT precise:
 - name, version, type of op.sys. Machine etc. Software name and version (and HW if relevant) etc.

Relation to evaluation criteria at item

- From item's evaluation criteria (accessible via) <http://www.item.ntnu.no/academics/grading/proj-grad> you will find the following criteria:
- **“Significance and originality**
 - **Novelty:** Does the work give new facts, ideas or insights? Are there innovative elements?
 - **Relation to the state-of-the-art:** Has the candidate shown sufficient insight into and overview over the problem domain? Does the manuscript include representative references to other work within the domain? Is the candidate able to put his/her own work into a wider context and the work of others? **The references and bibliography are important in this context.**
[In the last sentence highlighting is added]

How to write the reference list?

- Several ways of doing that, **keep to one method consistently**
- References *shall* be *ordered* in some way
 - Either alphabetically after author (quite normal)
 - chronologic after date of publication
 - Or chronologically after appearance in the text
- But **MORE** important than the ordering:
 - Write the references correct and detailed,
 - **list all references you have used (and no others)**
- Remember: Any other researcher shall be able to read and check your sources

Formal setup (one example)

- [1] W.J. Brook, “Modelling design and control of flexible manipulator arms: A tutorial review,” Proc. 29th IEEE Conf. on Decision and Control, San Francisco, CA, pp. 500-506, 1995. [this is a is a ‘Proceedings Paper’]
- [2] M Ozaki, Y. Adachi, Y. Iwahori, and N. Ishii, Application of fuzzy theory to writer recognition of Chinese characters, International Journal of Modelling and Simulation, vol. 18, page 112-116, 1998. [is a ‘Journal Paper’]
- [3] R.E. Moore, *Interval Analysis*, Englewood Cliffs, NJ: Prentice-Hall, 1966. [a book]

Other formats exists as well, choose one and stick to this

Latex and End-note offer support for this

This shows that the following shall be present (at least):

**author name,
title of document,
place of publication,
date (or version number or similar)**

How to refer to non-academic sources?

- A news article:
 - identify the author (name of journalist), Title (headline) and Place (name of newspaper or similar). (Add url)
- A whitepaper from a company:
 - If no author name is given: use the company name, Use report number, date or similar to identify the report (add url)

Other informal source

- "Private communication"
 - May be listed if important information is obtained
 - Prefer a written source if that exists
 - Ask the source about name vs anonymity
- Forum / developers zone etc
 - This is semi-open information: Ask the source about name vs anonymity
 - List if used and no other source exists for the same
- Informants in questionnaires, interviews etc.
 - Here anonymity is the rule, ask me, or consult a course/book in qualitative and quantitative methods

For less formal publications: web, newspapers, user manuals etc

- Use ‘best approximation’
 - Remember: The most important thing is that **other readers shall be able to identify your source** (uniquely, right version etc)
 - As a supplement you may add an URL to the other information.
 - BUT: Never use only URL
 - **The place of publication is important**

Why write place of publication (even if you have a URL)?

- The URL may change, but more importantly:
- **Everything may look glossy on the internet**
- Place of publication (like ACM Comm. Mag., book in well know series etc) is important information about the quality assessment process of the document
 - Is your source a good book by a well known professor, or a garage-report by a 16 year old?
 - Or a C-report from an average ntnu-student from last year?

More on quality and peer-review

- A journal paper is peer reviewed (norsk: fagfelleurdert)
 - peer review is a quality control,
 - (but strange papers are sometimes accepted...)
- A contribution to a standards meeting:
 - Most likely approved by upper management or qualified technical team within own company i.e. informal quality control
 - from well known companies: This assures some quality
- An official document in a standards body (like 3GPP or an RFC in IETF):
 - As a formal final document: approved by formal body
- A whitepaper from well known companies:
 - Has gone through internal quality control
 - But may still have a flavor of 'commercials' (use critical reading)

Papers with less quality control

- An 'internet-draft' has not gone through any quality control (i.e. it might be of poor quality, but it might also be excellent!)
 - For such documents you must use your own judgement
- Any webpage from a consulting company may look serious, but read with caution.
- A whitepaper can also be from a small unknown company, use your own judgement

On confidential reports

- Avoid 'secret sources' like confidential reports. These may typically be given to you by the company where you do your work (advisor's company)
 - Ask the item responsible professor (faglærer) if this issue arise
- If confidential reports are used:
 - They shall be listed in the reference list, marked conf.
 - May result in your report being confidential (båndlagt)
 - This will make it impossible for you to show the report to a prospect employer. This may not be what you want

wikipedia and web/google?

- Use with care!
- Know the difference between:
 - www.google.com
 - scholar.google.com
- Use the library sources:
 - helpful librarians in tech.lib (main building)
 - search facilities on www.ntnu.no/ub
 - useful info like <http://www.ntnu.no/viko/>
(English version: <http://www.ntnu.no/viko/en/>)

A statement/citation always comes with a context

- A pager (personsøker) is used by doctors at the hospital. The pager can send and receive text up to length xx
 - True in US hospitals
 - In Norway pagers can only receive (not send)
- Other contextual issues
 - Time matters
 - Type of document matters
 - +++

Precise and 'honest' use of references and citations

- Others shall be able to find your references
- They shall also be able to check that you are interpreting their writing in the correct way,
 - To take half a sentence from a longer argument may change the meaning
 - Avoid: 'Å lese som Fanden leser Bibelen'

'Fair and correct situation'

- Not everything in every source is 100% correct.
 - Example from a company webpage: ' Our product is worldleading'
- You may write:
 - The vendor himself writes in [1] that "this product is world leading", but I have found other independent sources [2], [3] who ranks this product far behind prodX [4] og prodY [5].
 - This shows judgement and independent thinking

Grading criteria (more)

- From the scores A and B in Norway:
 - **A** Excellent ...The candidate demonstrates excellent judgement and a high degree of independent thinking.
 - **B** ...The candidate demonstrates sound judgement and a very good degree of independent thinking.
- Judgement here include critical evaluation of sources.
Read 'competing' sources

Plagiarism / juks!

- *The American Heritage Dictionary* (2nd College Ed.) defines plagiarize as "to take and use as one's own the writings or ideas of another."
- Tasks:
 - Discuss the definition
 - Have you ever done plagiarism after this definition?
 - What about 'kok' of assignment in calculus 1?
 - Note that it is plagiarism even when the other person is informed that you are using his/her work

Plagiarism

- “Amount or quantity does not play a part in defining plagiarism. However, the amount of material plagiarized should play an important part in determining the appropriate corrective action. “

(from IEEE

http://www.ieee.org/publications_standards/publications/rights/ID_Plagiarism.html)

- See also

http://www.ieee.org/publications_standards/publications/rights/plagiarism_FAQ.html

5 levels of plagiarism

Taken from

http://www.ieee.org/publications_standards/publications/rights/ID_Plagiarism.html

The 2 'worst level' are easy to identify (you know it when you cross this line!)

- 1 Uncredited Verbatim Copying of a Full Paper, or Uncredited Verbatim Copying of a Major Portion (more than 50%) (...)
- 2 Uncredited Verbatim Copying of a Large Portion (greater than 20% and up to 50%) within a Paper (...)

5 levels cont.

- 3 Uncredited Verbatim Copying of Individual Elements (Paragraph(s), Sentence(s), Illustration(s), etc.) Resulting in a Significant Portion (up to 20%) within a Paper (...)
- 4 Uncredited Improper Paraphrasing of Pages or Paragraphs.
 - Instances of improper paraphrasing occur when only a few words and phrases have been changed or when the original sentence order has been rearranged; no credit notice or reference appears with the text.
- 5 Credited Verbatim Copying of a Major Portion of a Paper without Clear Delineation.
 - Instances could include sections of an original paper copied from another paper; credit notice is used but absence of quotation marks or offset text does not clearly reference or identify the specific, copied material. (...)
- Type 3, 4 and 5 are most common amongst students

For project and diploma work: Legal and grading consequences

- Large portions of copied text
 - expelled, no grading
- Often students have problems with citations in the 'background'chapter
 - Smaller portions of rewritten text without proper citation and quotation marks will be deducted on the evaluation as 'dårlig håndtverksmessig skikkethet (bad work) and/or bad use of state of the art knowledge
- Also smaller portions may cause you trouble!
 - If the text is central and/or presented as own ideas and/or results this may be defined as plagiarism / juks

New section: Examples:

- Examples of student texts with comments of the way references are used or not used
 - This student work is selected because it contains many examples of good use of references and some cases we can discuss
 - Also the content relates to material you all (shall) know (i.e. SIP)
- This section is not available electronically
 - Pick any student work and find your own examples

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- 15:15-16:00 Project report writing [Laurent]
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 - Structure
 - Writing process
 - Tools
 - Hints

(Slides based on original slides prepared by Associate Professor H. Øverby)

Motivation

- The process of thinking is different from the process of writing.
- Little training in report writing (?)
- Writing the report constitutes 25% to 30% of the total work.
 - 17 weeks → 5-6 for writing the report
- Presentation accounts for 25% of the grade.

Motivation

- Evaluation of the project assignment depends on:
 - Challenges and results
 - Originality
 - Methodology
 - *Presentation*
- Study the evaluation criteria and the evaluation form
<http://item.ntnu.no/academics/grading/proj-grad>

Motivation

- Presentation
 - **Structure:** Is the report written in a manner that makes it easy for the reader to get an overview over starting point/objectives, what is done and the conclusions/results, and to maintain this overview throughout the reading. Does the report contain the necessary elements as abstract/summary, table of contents, introduction, etc.
 - **Clarity:** Is it easy/possible/difficult/impossible to follow and understand what is written? Are proper references given to from where information is obtained? Are the references in the list complete?
 - **Information density:** Is the relation between content and volume satisfactory? How long is it between the “golden nuggets”? Are information about details unnecessary for progression of the reading put into appendixes?

Motivation

- Presentation
 - **Style:** Does the candidate make a distinction between essentials and details? Is the work boring to read? Is there an overview chapter/section (cf. structure) which makes the work more available?
 - **Illustrations and tables:** Are illustrations and tables clear, reasonably “self contained” and informative? Is there a duplication between text and illustrations/tables. Could some of the text be better presented/conveyed in the form of illustrations or tables?

Writing the report

- If you want to secure a good grade you have to write a good report.
- If you want to get credit for your work, you have to explain in details what you did
 - Make it easy for the reader to get an overview
 - Use a standard structure and style
 - Remember you are presenting an academic work, not selling a product
 - Explain, argue, discuss, analyze, derive principles/trends, ask/answer questions...

Writing the report

- 4 crucial aspects of the report
 - **The problem:** What is the problem? Provide a detailed description of the problem.
 - **Related work:** What have other people done? What will you be doing different from others?
 - **Methodology:** How have your results been achieved?
 - **Results:** What has been achieved? What are the answers to your questions?

Writing the report

- Think about who will read your report and what is necessary to document.
- Provide answer to the questions posed.
- Define symbols and concepts early in the report
 - Be consistent throughout the report.
 - Include a list of definitions, if relevant
- Be precise.
- Use figures, tables and diagrams, but
 - they must be relevant and self-explanatory,
 - they must be numbered, and
 - they must be referred to and explained in the text

Example

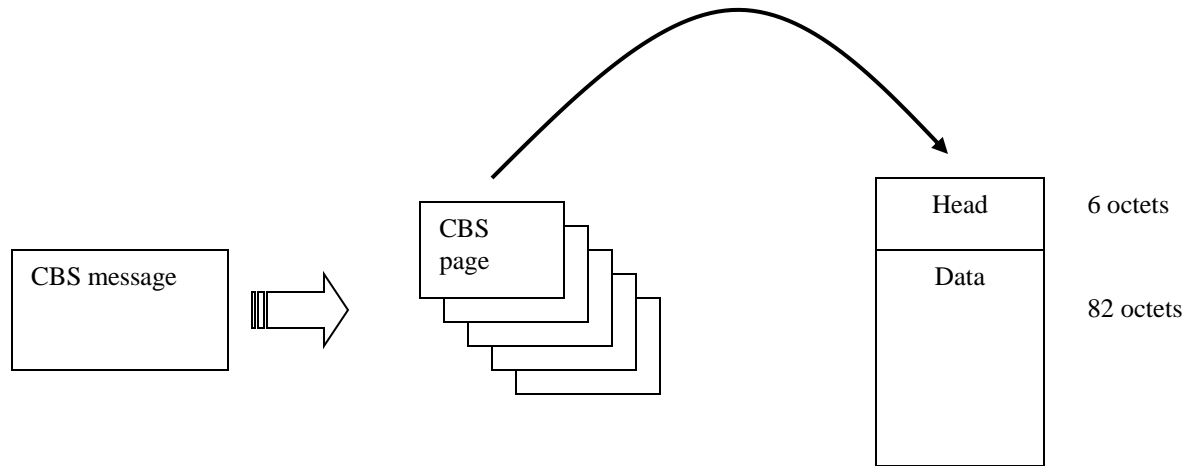


Figure 20: CBS message

Here we see a CBS. The CBS head consists of 6 octets and the data is 82 octets.

Example

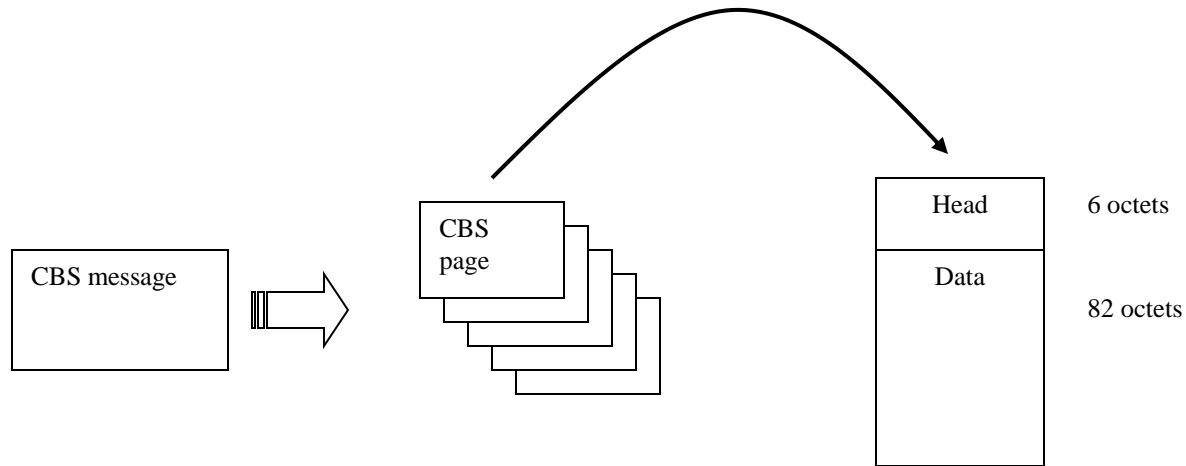


Figure 20: Structure of a Cell Broadcast System (CBS) message
A CBS message consists of 15 CBS pages. Each CBS page consists of 88 octets, in which the head constitutes 6 octets and the data constitutes 82 octets [5].

Writing the report

- Writing a good report takes time.
 - Making good figures takes time.
- Start the writing process early.
- Keep a note-book.
 - ~6 weeks before the submission deadline: get the outline of the report ready and ask you supervisor for comments
 - ~1.5-2 weeks before the submission deadline: have the first complete draft ready. Use the last week to get comments and proof-read your report.

Structure

- Summary / Abstract
- Foreword / Acknowledgement
- Contents
- Figure / Table list / Acronyms
- Introduction
- Related work
- Main part
- Conclusion / Discussions / Further work
- References and appendices

Structure

- **Abstract/Summary**
 - About 2 pages. What is the problem, what are the goals, results obtained, summary of the discussion of the results and conclusion.
- **Foreword/Acknowledgements**
 - When, by whom, where, thanks, etc.
- **Table of contents**
 - With page numbers.
- **List of figures/tables**
 - Either as two lists or a single list. All figures and tables should be listed here with references to the page they appear on.
- **Acronyms**
 - Acronyms used in the report should be listed here.

Structure

- Introduction
 - Background, what is the problem, scope and objective(s) of your work. It may also be relevant to state what you do not address.
- Related work
 - References you are building on/comparing to
- Main part – what *you* did
 - Incl. methodology, results

Structure

- Discussion
 - Are the obtained results as expected? Why/why not?
 - Comparison with similar works/systems
- Conclusion
 - Answer the questions posed in the introduction. What has been achieved?
- Further work
 - How to continue or extend your work.
- References
- Appendices
 - Additional details, complex parts, code documentation, etc.

Structure

- It is something recursive
 - Think about the structure of each chapter and section as well
 - State the goal of the section, how it relates to other sections, the (sub)problem it is addressing. Give a conclusion.
- The report and structure should be adapted depending on the topic:
 - Technical assignment
 - Development assignment
 - State-of-the art report
 - Theoretical work
 - ...

Writing process

- Often it is difficult to get started.
- It is an iterative process.
- Top-down strategy
 - Make first a table of contents and then write some parts/sections
 - Clear overview from the beginning, but possibly lot of updates some parts.
- Bottom up strategy
 - Write each part independently and then integrate the different parts.
 - Some parts will be finished early, but it may be hard to get a clear overview of the report
- A combination of the two strategies?

Formatting

- Language
 - English
 - Norwegian
- Format:
 - PDF
 - Make sure all fonts are embedded.
- Font / Font size
 - Time New Roman
 - Computer Modern
 - 11 or 12 pt
- *Check guidelines for the master's thesis*
http://daim.idi.ntnu.no/howto_thesis_submission.pdf

Tools

- Use your preferred tools.
- Text:
 - MS Word, LibreOffice, ...
 - LaTeX (TexnicCenter, WinEdt, LaTeXEditor, Kile, TeXShop, Textmate...)
 - LyX
- Figures/graphs
 - GNUPlot, Matlab, Mathematica
 - LaTeX in figures: Xfig, psfrag,... in graphs: Mathpsfrag
- References
 - BibTeX/EndNote (import it from Google scholar for instance)
 - Jabref, ReferenceManager, EndNote, BibDesk

Hints

- Observe how other reports are written
 - You know how a "good" report or book is like
 - What characterizes a report that is easy to read and understand
- Let other people read your report.
- The main goal with good report writing is efficient distribution of knowledge.
- Make something that is easy to read.
- Make backups...

Literature about report writing

Day, Robert A. *How to write and Publish a Scientific Paper*

Hacker, Diana. *A Writer's Reference*. Boston: St.Martin's Press 1999

Skårdal, Dorothy burton. *Rules for Writing English*. Stavanger: TK-Series 1992

Good luck with your project and
writing your report