

**SE 3I03 Fall 2004**

# **02 Writing Technical Documents**

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# Differences between Oral and Written

- The listeners of an oral presentation are a captured audience unlike the readers of a written presentation
  - The speaker controls the pace and order of a talk
  - The reader can choose how to read a paper
- Oral presentations use:
  - Language as it is spoken
  - Emotion and voice modulation to convey meaning
  - A wide range of audio and visual aids
- Written presentations use:
  - Language as it is written
  - Capitalization, punctuation, and italicization to convey meaning
  - A narrow range of visual aids

# Kinds of Technical Documents

- System specifications and descriptions
- User manuals
- Executable code
- Feasibility studies
- Proposals
- Research papers
- Position papers
- Letters and memorandums

# Components of a Technical Document

- Title page
- Abstract
- Introduction
- MAIN BODY
- Conclusion
- Acknowledgments
- Footnotes, endnotes, etc. (optional)
- Appendices (optional)
- References

# Title Page

- Should always contain:
  - Title
  - Authors and their affiliations
  - Date
- How should the authors be ordered?
  - Order of importance  
(common in science and engineering)
  - Alphabetical order  
(common in computer science and mathematics)
- The relative contributions of the authors can be described in the text

# Who Should Author a Paper?

- Choose coauthors who:
  - Are good writers
  - Are the major participants in the work
  - Will bring attention to the paper
- The coauthors should not include anyone who did not participate in the work
  - Examples: Laboratory directors and supervisors
- People who made minor contributions to the paper can be mentioned in an acknowledgments section

# Abstract

- Microversion of the paper
- Serves as a gateway to your paper
- Should be very widely understandable
- One short, self-contained paragraph is best
  - Avoid technical jargon
  - Avoid special fonts, symbols, and notation
  - Avoid references

# Introduction

- State the purpose of the paper
- Present the background needed for the paper
- Explain what knowledge will be assumed
  - Give references if possible
- Give an overview of the paper



# Conclusion

- Different possible forms:
  - Summary
  - Set of conclusions
  - Set of recommendations
  - Pointer to related or future work
- Use the paper as a springboard for the conclusion

# Notes

- These are notes that the author, for one reason or another, does not want to include in the main text of the document
- They can appear:
  - At the foot of a page (footnotes)
  - At the end of the document (endnotes)
  - In the margins (margin notes)
  - On a Web site (Web notes)
- The text of the document is linked with the notes using **note markers**
  - They are usually small, raised numbers
  - They may also be special symbols, sequentially ordered
- Notes are sometimes confused with references

# References

- References are the **sources** on which the document is based
  - They establish the context for the document
  - The set of references is called the **bibliography**
- The references should appear at the very end of the paper ordered alphabetically by the authors' last names
- The text of the document is linked with the references using **reference markers**
- Three main styles of reference markers:
  - Note markers (not recommended)
  - [3], [3-5,7], [3, pp. 45-79]
  - [Turing 1936], [Church, Turing 1938], [Tur36], [TC38]

# What should be Referenced?

- Previous and current related work
- Sources of terminology, notation, etc.
- Sources of quotations, tables, pictures, etc.
- Ideas and conclusions that are not the author's
- Avoid references that are:
  - Not readily accessible (e.g., written in Gaelic)
  - Unpublished manuscripts
  - On Web sites

# What should a Reference Contain?

- Each reference, if possible, should contain:
  - Author's name
  - Title of document
  - Publication details
- Web page references should contain:
  - Author's or organization's name
  - Title of the Web page
  - Name of the Web site
  - URL in angle brackets or typewriter font
  - Date information was last updated
  - Date information was accessed
- References should be written in a uniform, concise style

# References: Recommendations

- Be careful to reference the work of others
- List references alphabetically
- Avoid inaccessible and unpublished references
- Be careful using Web references
- Examine all the sources you reference

# Grammar, Spelling, Capitalization, And Punctuation

- Never release a document that has grammar, spelling, capitalization, or punctuation mistakes
- Use American, British, or Canadian English spelling, but not a mixture
- As much as possible, follow standard conventions for capitalization and punctuation
  - Whether you adopt a style or develop your own style, be conservative and consistent

# Text

- Use a standard 11pt or 12pt font for the main text
  - Use other fonts sparingly
  - Use bold face for headings, but avoid using it in the main text
  - Avoid using colored text
- A typical line should contain 10–15 words
- Use italics instead of underlining



# Linguistic Distinctions

Be careful when distinguishing between:

- Expressions and their values  
356 (string) vs. 356 (number)
- Expressions with and without syntactic variables  
 $x < 2$  (simple expression) vs.  $A < 2$  (schema)
- Inputted text and outputted text  
(17 + 31) vs.  $\rightarrow 48$
- Unisymbol variables and multisymbol variables  
val (name) vs. *val* (3 variables)

# Writing Approaches

- Incremental development
  - Write pieces of the paper as the work is being done
- Successive refinement
  - First write an outline
  - Then expand the outline into a full paper
- Spiral approach
  - Write sections in the order 1, 2, 1, 2, 3, 1, 2, 3, 4, ...
- Seed approach
  - First write the most important or best understood part of the paper
  - Then expand this part into a full paper

# Final Tips

- Find a writing style that works for you
  - Start with a conventional approach
  - Be conservative
- Find a way to make your paper interesting—something people will want to read