Technical Writing

Professional Communications
Overview

- Plan the document
- Write a draft
- Have someone review the draft
- Improve the document based on the review
- Plan, conduct, and evaluate a usability test
- Modify and write the final document
Planning the Manual

• Determine your purpose
• Consider the audience
• Determine a schedule
• Determine sets of actions the user must perform
• Analyze the steps
• Select visual aids
• Format the document properly
Determine Your Purpose

• Which topics are important for the user?
• What level of detail is appropriate for each topic?
• Focus your sense of purpose
Consider the Audience

• How much do they know about the general terms and concepts?
  – Make a list of terms your users understand

• What should the user be able to do after reading the document?

• How will the user read the document?
  – Probably not from beginning to end!
Consider the Audience

• Where will the users use the document?
  – Consider lighting conditions or font size for easy readability

• Does the user really want to read a document?
  – Probably not
  – Make it useful and “trustworthy”
Determine a Schedule

• Plan for a review of the draft
• Set a precise date for the review, who will be part of the review team, and what kind of feedback you expect
Create a Gantt Chart

- Get Specifications
- Design Document and Usability Test
- Prepare Draft
- Review Draft
- Conduct User Test
- Prepare Final
- Final Due

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Discover Sequences

• Find out what the software does
• Find out what people are supposed to do when they use it
  – These actions form the basis for the Procedures Section
Analyze the Steps

• Name each individual action that a user performs
• Write a set of instructions
• Make a flow chart or a decision tree
  – List each action and show how it fits into a sequence with other actions
Select Visual Aids

• Goal is to create a text-visual interaction that best conveys the information

• Use visuals to eliminate text as much as possible
  – Visuals reassure readers that they are “in the right place”
Format the Document

• Must be easy to read

• Associate a particular space on the page with a particular kind of information
  • For example: “All figures are in the lower left-hand corner”
  • Create a *template* page that indicates placement of page numbers, headers, footers, rules, blocks of text, headings, and figures
  • Start with a tentative template (may change as the document progresses)
## Writing the Document

<table>
<thead>
<tr>
<th>Component</th>
<th>Required?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title page</td>
<td>Yes</td>
</tr>
<tr>
<td>Table of Contents</td>
<td>Yes</td>
</tr>
<tr>
<td>List of Illustrations and Figures</td>
<td>Yes</td>
</tr>
<tr>
<td>Introduction (Overview)</td>
<td>Yes</td>
</tr>
<tr>
<td>Information for use of the documentation</td>
<td>Optional</td>
</tr>
<tr>
<td>Concept of operations</td>
<td>Optional</td>
</tr>
<tr>
<td>General Use</td>
<td>Optional</td>
</tr>
<tr>
<td>Procedures</td>
<td>Yes (Instructional Mode)</td>
</tr>
<tr>
<td>Information on software commands</td>
<td>Optional (Reference Mode)</td>
</tr>
<tr>
<td>Error messages and problem resolution</td>
<td>Yes</td>
</tr>
<tr>
<td>Glossary</td>
<td>Yes</td>
</tr>
<tr>
<td>Related informational sources</td>
<td>Optional</td>
</tr>
<tr>
<td>Navigational features</td>
<td>Optional</td>
</tr>
<tr>
<td>Index</td>
<td>Yes</td>
</tr>
<tr>
<td>References</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Title Page

- Document title
- Course and section number
- Your team name and the name of each member of your team
- Date of submission
- Draft written at top of draft only (final version has nothing written at top)
Table of Contents

• List the topics with page numbers
  – Wording is identical to what appears in the text
• Include sub-topics and page numbers, indented
• Include all information that follows the Table of Contents
  – Introduction, Concept of Operation, Procedures, Glossary, References, Index, etc.
List of Illustrations and Figures

• Separate page following Table of Contents
• List all illustrations and figures with page numbers
  – The wording is identical to what appears in the text (the caption on the illustration or figure)
  – Include illustration number or figure number
The Introduction

• The introduction starts out by describing the intended audience, scope and purpose for the document

• Include a brief overview of the software purpose, functions, and operating environment
The Introduction

• The Introduction should also give an indication of the organization of the document
• Make the structure obvious to the reader
• Not only should the parts of the document be ordered in a logical way, but this logic must be communicated to the reader in the Introduction
Procedures Section

- 3 parts:
  - Preliminary Information
  - Instructional Steps (sub-sections)
  - Completion Information

- Each sub-section in the Procedures Section must have a separate introduction
  - However, preliminary information common to several procedures may be grouped and presented once to avoid redundancy
Procedures Section

• A brief summary at the start and end of each sub-section is helpful, such as a few sentences linking one section to the next

• For example:
  – *Together these results show that the hypothesis holds for linear coefficients. The difficulties presented by non-linear coefficients are considered in the next section.*
Procedures Section

• Each sub-section should include:
  – A brief overview of the purpose of the procedure and definitions or explanations of necessary concepts not elsewhere included
  – Identification of technical or administrative activities that must be done before starting the task
  – A list of materials the user will need to complete the task, which may include data, documents, passwords, additional software, and identification of drivers, interfaces, or protocols
  – Relevant warnings, cautions, and notes, that apply to the entire procedure
  – The procedure for completing the task
Error Messages and Problem Resolution Section

• Address all known problems with using the software in sufficient detail such that the users can either recover from or report the problem

• May include contact information for reporting problems with the documentation, or suggesting improvements
Glossary

• Must include terms in the glossary if they are likely to be unfamiliar to the audience
• Alphabetical list of terms and definitions
  – Include abbreviations and acronyms with their definitions
• Terms included in the glossary should also be defined on their first appearance in the printed document
Index

• Alphabetical listing of keywords, graphics, or concepts with a page number for each

• An index entry may cross-reference another index entry
  – The referenced entry should give a page number and not point to a third index entry
Quotations

• A short quote is enclosed in double quotes
• Long quotes are set aside in an indented block, without quotation marks
• The quoted material should be an exact transcription of the original text
• The expression [*sic*] is used to indicate that an error is from the original source
References

• References are listed at the end of the document, alphabetically by the authors’ last names

• You must cite the reference in the text
  – The event handler implements the well-known Observer design pattern (Hackos, 1999).
References

• Journal articles
  – The journal name should be given in full, and author names, paper title, year, volume, number, and pages must be provided if available
References

• Conference papers
  – The conference name should be complete, and authors, title, year, and pages must be provided
  – Information such as publisher, conference location, month, and editors should also be given if available
References

• Books
  – Give title, authors, publisher and publisher’s address, year, and (if relevant) edition, and volume
  – If the reference is to a specific part of the book, give page numbers
    • (Howling 1994; pp. 22–31)
  – If the reference is to a chapter, give its title, pages, and if applicable, authors
References

• Technical reports
  – In addition to title, authors, year, and report number, you need to provide the address of the publisher (which is usually the author’s home institution)
  – If the report is available online, give the URL
References

• Web pages
  – If you cite a web page, attempt to find a durable URL that is unlikely to change
  – In addition to the usual details, give the URL and perhaps some search terms and the date last accessed
  – Make sure you represent any unusual characters correctly
Reviewing the Work of Others

- Reviewing the work of others can often be difficult.
- Reviewing can be a chore, but deserves the same effort, care, and ethical standards as creating the original work does.
- Reviewing can also lead you to look at your own work with a fresh perspective.
  - It can expose you to different kinds of failure.
Reviewing the Work of Others

• Reviewing means evaluating how well a document achieves its purpose in terms of its intended audience
  – Is the content accurate, appropriate, and useful?
  – Is the material organized for the reader’s understanding?
  – Is the style clear, concise, fluent, exact, and engaging?
  – Are visuals and page designs effective?
Reviewing the Work of Others

• Read the entire document at least twice before you comment
• Be honest but diplomatic
  – Begin with something positive
• If something does not work, explain why
  – Instead of “This paragraph is confusing” offer “I had trouble discovering the main idea because this paragraph lacks a clear topic sentence”
Elementary Nit-picking

• Search for errors that don’t affect the quality of the work but should be corrected
  – Look for errors in spelling and grammar, written descriptions, errors in the bibliography, whether all concepts and terms have been defined or explained, errors in formulas or mathematics, inconsistencies in variable names, tables, figures, etc.
Writing Comments

• A clear explanation of the faults of the document should be provided, with specific examples of where improvement is needed
• Describe any changes that need to be implemented to improve the document, both technically and stylistically
• Include constructive comments and positive feedback where appropriate
Reviewing Checklist

✓ List the changes, major and minor, that should be made before final submission
✓ Help the author by indicating not just what to change, but what to change it to
✓ Check details such as mathematics, formulas, and the bibliography
✓ Make sure you comments are fair, specific, and polite
Revising Drafts

“There is no writing, only re-writing”

Revision encompasses four tasks:

1. Adjusting and reorganizing content
2. Editing for style
3. Editing for grammar
4. Editing for mechanics
Adjusting and Reorganizing Content

• Expand sections that deserve more attention
• Shorten sections that deserve less
• Change the location of sentences, paragraphs, or entire sections
Editing for Style

• Shorten paragraphs
• Shorten sentences
• Rearrange a paragraph to place the main point first
• Change passive voice sentences to active voice
• Define technical terms
Editing for Grammar

• Check comma placements
• Check subject-verb agreement
• Check words that are commonly misused
  – Affect/effect, complementary/complimentary, etc.
• Focus on the typical errors that you have had trouble with in the past
Editing for Mechanics

• Check for misspelled words, misplaced pages, incorrect page numbers, missing figures, and errors in mathematics or numbers
Final Suggestions

• Depend on another set of eyes besides your own
  – Don’t make the changes suggested by someone else unless you fully understand the reason for doing so

• Print your document out, set it aside for a day or two, and read it over to check for flow, consistency, and mechanical errors
Draft Revision Checklist

✓ Titles and headings should be consistent with the content
✓ All terms should be defined
✓ The style of definition should be consistent (e.g., italics or not)
✓ Terminology should be used consistently
✓ Abbreviations and acronyms should be stated in full when first used
Draft Revision Checklist

✓ All section heading and terms should be capitalized in the same way
✓ The style and wording of headings and captions should be consistent
✓ Tense should be used consistently
✓ Hyphenated words should be consistent
✓ Units should be consistent and logical
  – e.g., Mb, MB, Mbyte, megabyte
Draft Revision Checklist

✓ Numerical values of the same type should all be presented with the same (reasonable!) precision
✓ Graph axes should be labeled and the units given
✓ Tables and figures should be formatted consistently (e.g., indentation, centering)