Technical Writing for Papers and Proposals

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Most engineers assume that one form of technical writing will be sufficient for all types of documents.

This is absolutely not true.

This presentation will help you sharpen your technical writing skills so that you have a greater chance of your papers getting accepted and your proposals succeeding.

- **The importance of 'knowing' your audience**

- **Technical writing for journal and conference papers**

- **Technical writing for proposals**

- **Creating effective slide presentations**

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Image Source Page: http://www.historiann.com/wp-content/uploads/2010/05/audience.jpg

THE IMPORTANCE OF KNOWING YOUR AUDIENCE

The Importance of Knowing Your Audience

Knowing your audience is critical to writing a good technical document – or any written material, for that matter.

If people think you do not understand who they are and what they are interested in reading, then they simply won't read your work.

Who will be reading your paper, proposal, or slides?

- Peers in your specific field?

- Peers in your general field?

- Technical people not in your field?

- A non-engineering but professional audience?

**Decide who is
your primary audience**

**Understand who are
your secondary audiences.**

The Importance of Knowing Your Audience

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Why would these audiences want to read your material?

- Write down specifics in answer to this question – this will help you create a focus for your material.

- Create an outline before you start writing – this will help you organize your thoughts.

- Use the resources of this university to help you with this step.
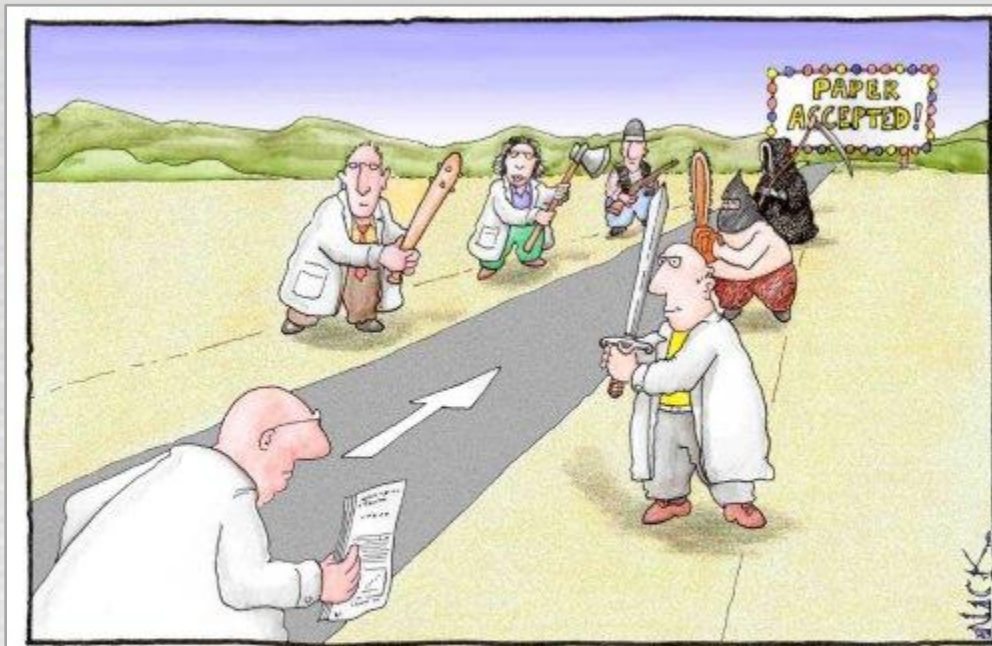
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TECHNICAL WRITING FOR JOURNAL AND CONFERENCE PAPERS

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Technical Writing for Journal and Conference Papers

You **must** check the style guidelines of the journal or conference paper.

- **This is the first thing that the editors of the journal or conference will check – and reject if you don't comply.**

- **Suggested strategy:**

  - Find out and understand the style.

  - Write your paper freely; don't be overly concerned about the style at this point.

  - Once you have written and edited your paper, then format it according to style guidelines.

- **Also, create your own 'style sheet' to keep track of terms you use.**

Technical Writing for Journal and Conference Papers

Every journal and conference has some kind of style guide they want you to follow.

The style guide includes:

- Font type and size
- Double space, single space, etc.
- The way headers should look
- Indent or spaced paragraphs
- Abstract word count
- Keywords? Highlights?
- Page length of paper
- How to submit artwork and tables

Sample style guides

IEEE Editorial Style Manual

http://www.ieee.org/portal/cms_docs_iportals/iportals/publications/authors/transjnl/style manual.pdf

Elsevier Computer and Chemical Engineering style guide

http://www.elsevier.com/wps/find/journaldescription.cws_home/349/authorinstructions

Springer's Bulletin of Earthquake Engineering

http://www.eaee.boun.edu.tr/BEE/BEE%20format.pdf

Technical Writing for Journal and Conference Papers

Many style guides are incomplete.

For instance, they may not tell you how to format your figure captions or table titles.

Look at a couple of recent published articles in that journal to find out missing style information.

Don't hesitate to call or email an editor of that journal or conference to find out style information. Usually, they would be happy to help you.

Style guides

- Ignore style guides at your peril

- Teach your grad students to understand and prepare papers using the style guides

- But -- don't let the style guide hamper your writing style
    - Know the style of the journal before you start writing.
    - Write your heart out.
    - Then, conform the paper to journal style.

Technical Writing for Journal and Conference Papers

An Editor-in-Chief once told me that it could take a lifetime to learn the art of knowing when to stop writing.

There is a point in your writing – or editing – where you must stop or risk having your material degenerate.

If there is too much information thrown into a paper – then, perhaps you need to write two or three separate papers…

When writing a technical paper:

- Know your audience
- Know the style guide
- Write your heart out
- Check the details
  - In-text citations and references
  - Conformance to style
  - Grammar and punctuation
  - Equations, figures, and tables
- Use university resources
  - Librarians
  - Writing Center specialists
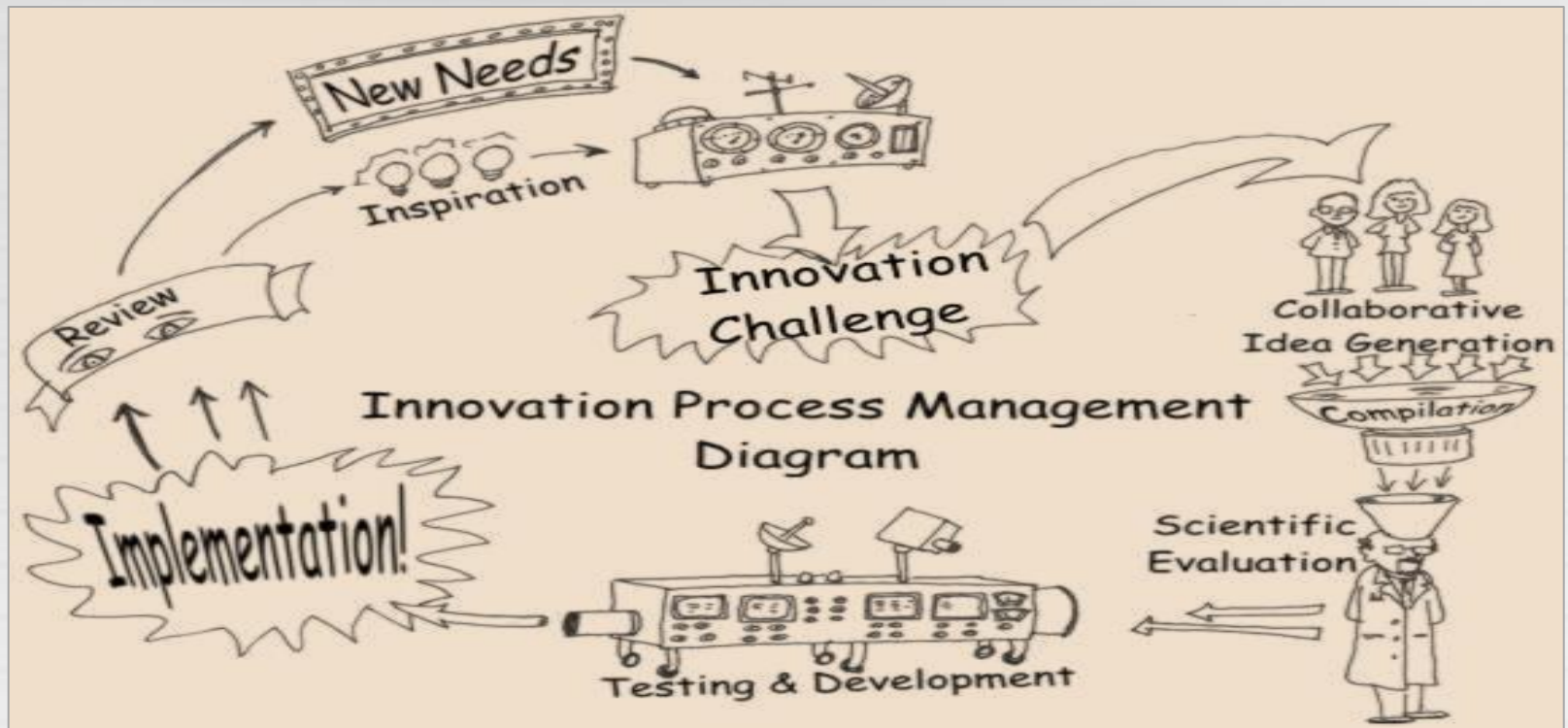 - COE Technical Writer
- Know when to stop!

One final thought…

In the pre-internet days, it might have been OK to pay less attention to conference papers than to peer-reviewed journal papers.

Today, everything is published on the internet – and stays there for a very, very long time.

Pay equal attention to all your papers, no matter where they may be published.

http://www.jpb.com/pictures/ipm_cartoon.jpg

There are slightly different rules for proposal writing than for writing a paper.

TECHNICAL WRITING FOR PROPOSALS

Technical Writing for Proposals

If you understand from the outset that the proposal process can be stressful, then you can plan your strategies more effectively.

Proposal writing is a very stressful process

- Tight deadlines.

- A great many rules and requirements.

- You are emotionally invested in the result.

- The stress increases with the number of collaborators involved.

Technical Writing for Proposals

Knowing who is reading and evaluating your proposal is extremely important.

As with papers, know your audience.

- Technical readers, not necessarily in your field of expertise.

- Financial and legal advisors.

- Government officials.

Your audience sees thousands of proposals

- They quickly know what is genuine and what is not.

- They want you to cut to the chase rather than create elaborate explanations.

- They want you to answer their questions very specifically.

Technical Writing for Proposals

In some proposal style guides, it is actually written "…if you do not comply with this format, we will not look at your proposal."

You **must** follow the style guide or risk rejection

Sample proposal style guide

Grants.gov and Fast Lane for National Science Foundation (NSF) proposals

http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg

Technical Writing for Proposals

If you don't create a calendar or checklist for milestones and deadlines, you risk either forgetting something or missing your deadline.

Create a milestones and deadline checklist

- This helps you keep track of all the forms and documents

- Give a copy to all collaborators, but make sure one person is responsible for tracking everything.

- Allow yourself plenty of 'slip room' in case of delays.

Milestone Calendar

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
Jan 1	2	3 Kickoff meeting of collaborators	4	5	6 Bio sketches and current & pending support forms to Tech Writer	7
8	9 1st draft sections of Project Narrative submitted to PI	10	11 1st draft of Project Narrative to Tech Writer	12	13 Complete all required forms and check	14
15	16	17 1st draft Project Summary to Tech Writer	18	19 1st draft of Data Management Plan to Tech Writer	20	21
22	23 1st draft budget to OSP for review	24 Final drafts complete of all written material	25 1st draft budget narrative to OSP for review	26 All final docs submitted to OSP	Jan 27 Deadline 5 pm EST	28

Technical Writing for Proposals

Writing suggestions

- Really know your audience
- Know the style guide
- Write your heart out
- Check the details
  - Compliance to requested information
  - In-text citations and references
  - Conformance to style
  - Grammar and punctuation
  - Equations, figures, and tables
- Create a recognizable 'look'
  - We have done this for UNLV's College of Engineering
  - It is a recognizable logo in the footer
- Know when to stop!

Technical Writing for Proposals

Please try to avoid:

Writing so much text that the document looks 'jammed.'

- Edit your proposal down to the essentials.
- Don't tire your readers with lengthy and difficult language.
- White space adds elegance.

Please try to avoid:

Using the word "transformative" or "innovative"

- This challenges the reader to refute your claim.

- Instead, write such a thoroughly good proposal that the reader will declare for themselves that your work is transformative or innovative.

Final thoughts

Winning a proposal is a complex process

1. Quality of research
2. Need for this kind of research
3. Quality of proposal writing
4. Political aspects
5. Funding aspects
6. Many more factors involved

The point of creating a well-written proposal is to make sure that elimination will not occur to due Factors 1, 2, and 3.
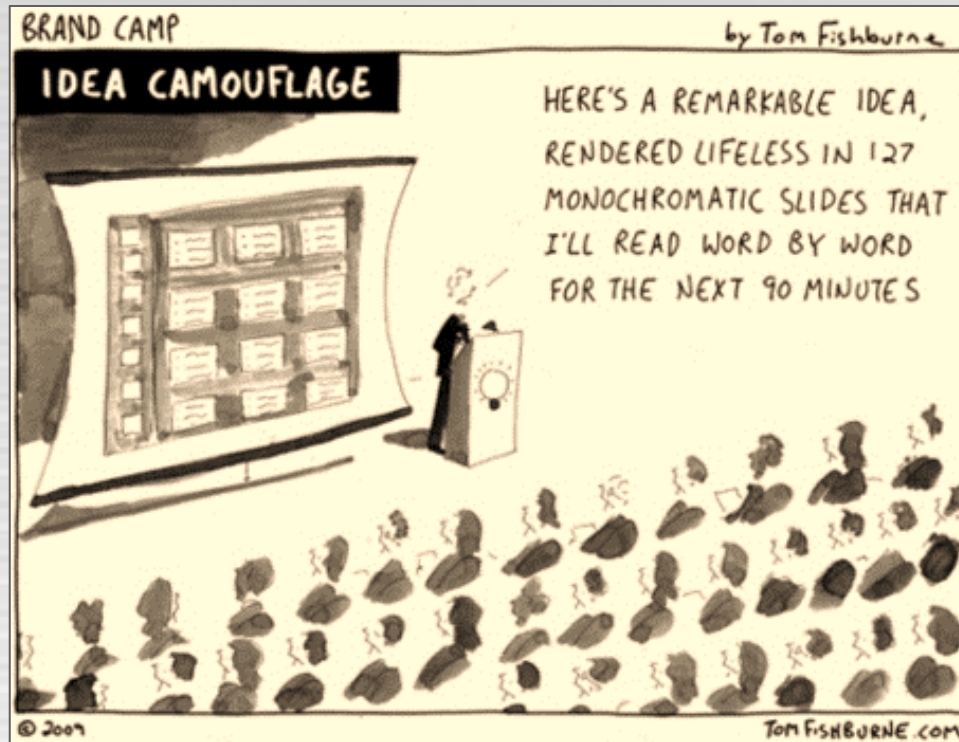
Image Source Page: http://img.scoop.it/2Xa5S16u-0oAsEoWCLZOTl72eJkfbmt4t8yenImKBVaiQDB_Rd1H6kmuBWtceBJ

CREATING EFFECTIVE SLIDE PRESENTATIONS

Creating Effective Slide Presentations

- Know your audience

- Create for yourself a style guide so that your slides look elegant, professional, and consistent

- Check the details

- Images are OK, but you also need text, especially if the slides are going to be posted on the internet.

- Know when to stop – avoid too many words or images.

- Rule of thumb: If you are giving a presentation, three minutes per slide.
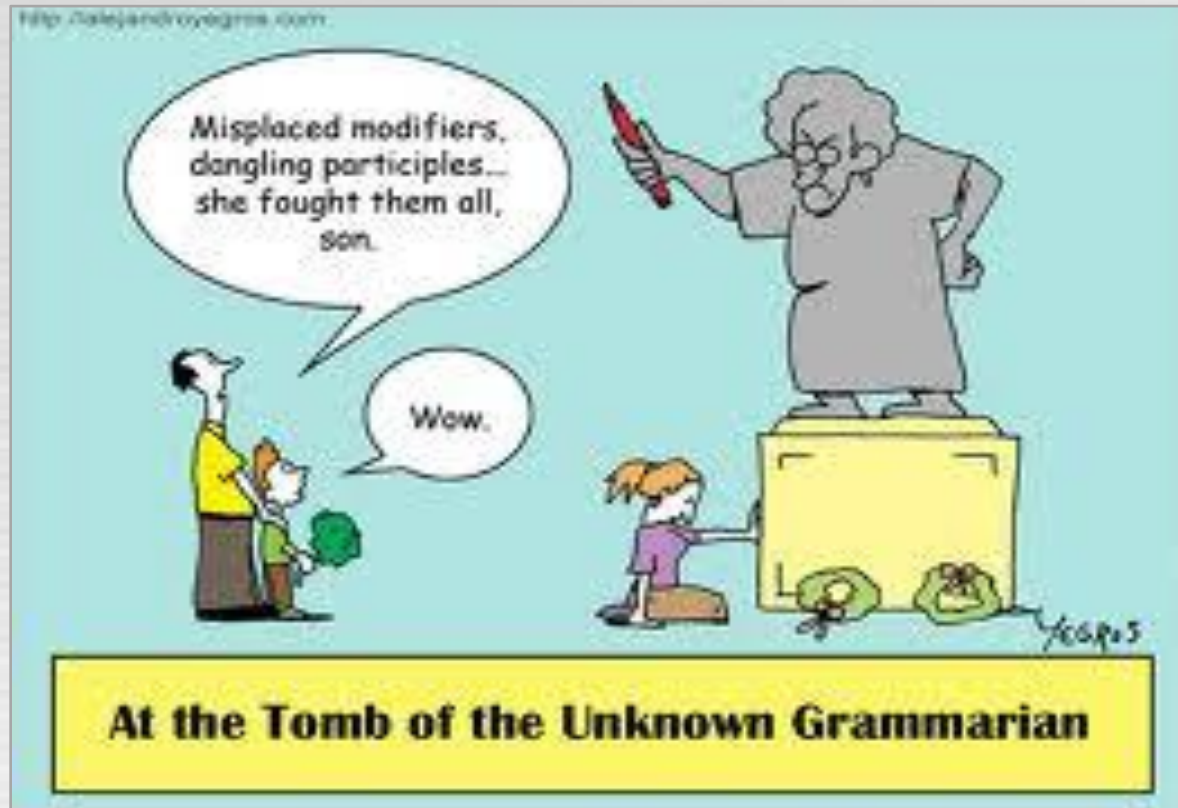
Image Source Page: http://jeffreyhill.typepad.com/.a/6a00d8341d417153ef01310f66dd21970c-800wi

These are errors common to engineers…

GRAMMAR AND PUNCTUATION BASICS

Grammar and Punctuation Basics

Numerals versus words to express numbers

Use numbers to express:

- 10 and above

- Numbers in the abstract of a paper or graphical display

- Numbers that immediately precede a unit of measurement (10 cm)

- Numbers that represent statistical or mathematical functions, fractional or decimal quantities, ratios, percentiles, and quartiles   0.34 or 5:7

- Numbers that represent time, dates, ages, scores, points, exact sums of money

- Denotes a specific place in a series (Grade 8, but also eighth grade)

Grammar and Punctuation Basics

Numerals versus words to express numbers

Use words to express:

- Any number that begins a sentence, title, or text heading

- Common fractions (one half)

- Universally accepted usage (The movie, "The Seven Samurai")

Grammar and Punctuation Basics

Use (or overuse) of commas and semicolons.

- This is a very common issue with engineering documents.

- Because most papers and proposals include difficult concepts and equations, it is very important to use commas and semicolons correctly in order to help the reader.

- Avoid the overuse of parentheses – again, this will cause 'brain freeze' in deciphering a lengthy and difficult sentence.

- After you have written your paper, read it as if you were the audience and try to break up the longer, more difficult sentences and paragraphs.

Grammar and Punctuation Basics

Use (or overuse) of commas and semicolons.

UNLV's Writing Center offers a workshop on Punctuation, which all engineering writers should attend.

PUNCTUATION. Do you feel uncomfortable with commas or wonder what to do with semi-colons? This session will discuss all types of punctuation and help improve your sentences.

http://writingcenter.unlv.edu/wkshops/classes.html

Grammar and Punctuation Basics

The overuse of 'i.e.' and 'e.g.'

- Engineering writing is very complex and hard to follow.

- 'i.e.' means 'that is' and 'e.g.' means 'for example.'

- It will be easier on the reader if you simply use the English words instead of the Latin acronyms.

Grammar and Punctuation Basics

Lists:

‘and’

‘as well as’

Semicolons

Bullets

- Sometimes the document has a list, but the list itself is complex.
- If the list is simple, then use ‘and.’

    “… A, B, and C.”

- If the list is complex, use ‘as well as,’ especially if the first items are similar and the last is slightly different

    “…eggs, flour, milk as well as bowls.”

- If you describe each item and have commas, then the list must be differentiated with semicolons.

    “…eggs, which are bought from the organic farm; milk, which we got from our dairy cows; and ceramic bowls, specially made for us.”

- Any lists more complex than those above really should be placed in bullet form.

Grammar and Punctuation Basics

'such as'

- ...such factors as a, b, and c.
- …factors, such as a, b, and c.

Grammar and Punctuation Basics

'that' and 'which'

- "That" is used with restrictive phrases – phrases that are essential to the sentence.

- "Which" is used with nonrestrictive phrases – phrases that are not essential to the sentence.

- When you use 'which,' a comma precedes it.

Grammar and Punctuation Basics

Acronyms

- You **must** write out an acronym the first time you use it in the body of the paper.

- Write the term first and then put the acronym in parentheses.

- Also write out the acronym in the abstract – however, you also must write it out again when first used in the body of the paper.

- If you have a great many acronyms, and you use them frequently throughout the paper, it is a courtesy to your readers to provide a Glossary list at the end of your paper.

RESOURCES

Resources

- Julie Longo, College of Engineering Technical Writer
  julie.longo@unlv.edu

- Caroline Smith, UNLV Librarian for UNLV's College of Engineering
  caroline.smith@unlv.edu

- Jeanette Bernard-Snyder, *Sr. Research Administrator, Office of Sponsored Programs*
  jeanette.bernard-snyder@unlv.edu

- UNLV's Writing Center
  - Individualized assistance
  - Workshops recommended for Engineers
    http://writingcenter.unlv.edu/wkshops/classes.html
    - *Grammar Refresher I & II*
    - *Mastering the APA Style*
    - *Top Ten Grammar Mistakes and How to Avoid Them*
    - *Punctuation*
  - Writing Tips – APA Style http://writingcenter.unlv.edu/writing/apa.html

- UNLV Thesis and Dissertation Style Guide
  http://graduatecollege.unlv.edu/PDF_Docs/TDGuidelinesFormat.pdf

- Purdue's Online Writing Lab (OWL) http://owl.english.purdue.edu/

- Identify great scientific writers (current and historical) and study their writing styles