

To: ENGR 199 Students

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Date: August 27, 2007

Subject: Writing Technical Memos – Structure and Content for Memo Reports

Memos are routinely used in engineering companies to communicate and document technical analyses, project status, justifications for decisions and issues requiring action. Well-written memos are concise, clear and direct. The exact format of a memo is fairly flexible. Although many companies provide detailed style guidelines, there are some basic conventions for structure and content. This memo outlines the format to be used in ENGR 199 class assignments and approved by IPFW's Engineering Faculty.

This section illustrates a typical memo's introduction. It describes the purpose in a short and to-the-point manner. It allows the reader to scan the section and quickly identify the subject matter and assess its urgency and relevance.

Summary

Most memos consist of a header, description of purpose, summary, discussion, and conclusion. When appropriate, a reference list and attachments can be appended to the end of the memo.

The key format conventions include:

1. The memo's header includes *To*, *From*, *Date*, *cc* (copies), and *Subject* as illustrate above. A unique reference number is sometimes furnished to facilitate future reference.
2. The memo should begin with a *Description of Purpose*. This statement is written in terms of the purpose of the work or written in terms of the purpose of the memo. The former is usually preferable.
3. The header, description of purpose and summary should be condensed onto a single page.
4. The first page should explicitly communicate the "bottom line." This is often the key conclusions, recommendations and what action the reader should take.
5. Subsequent pages include a detailed *Discussion* of the subject followed by a *Closing* section that itemizes and details the conclusion and all the action items..
6. *Attachments* (or appendices) are also included at the end of the memo when required. Back up material must be carefully organized and presented. Simply stapling a sheaf of pages to memo is not acceptable.
7. Write the *Purpose*, *Discussion* and *Closing* sections before summarizing them in this section.

As with all writing, you must consider your audience when writing a memo. What do they expect? How do they prefer material to be presented? Some audiences will prefer an outline format and others a narrative presentation. Unless otherwise instructed, your primary audience for memos is your fellow students.

Discussion:

Memos must include appropriate content and have a professional tone and format. Below is an outline and descriptions of typical memo sections.

Header

This memo is in standard format. Note that the header contains:

1. To: the name or names of the author of this work
2. From: the name or names of the primary recipients. This is usually the people who will act on this work or who requested it.
3. cc: name or names of other people who need to receive a copy (usually for their information). The “cc” is an archaic reference to carbon paper copies
4. Date: the date the memo was issued. Spell out the date.
5. Subject: a brief but specific statement of the memo’s topic. It should be unique so that it can be used as an identifier.

Attempt to be egalitarian in addressing memos. It is most common in U.S. industry to simply use names without titles (i.e., no Mr., Ms., Dr., etc.). If titles are used, all names should be presented with similar titles. If you use Dr. when addressing a memo to your instructor, you must refer to yourself and your classmates as Mr. or Ms. Always check the spelling of names and if the memo is to be delivered in hard copy (as opposed to electronic delivery) initial by your name on the original copy.

Purpose

The first paragraph of the memo should explain the purpose of the work being described or the purpose of the memo. Consider answering the reporter’s standard questions: Who? What? When? Where? How? This section may have the section title, “*Purpose*” or “*Objective*”, or may be presented in the first paragraph without title.

Summary

The *Summary* should provide a synopsis of the entire work with a focus on the meaning and importance of subject being addressed and any future action that may be required as a result of the described work. It includes a brief description of what methods were used, what information or results were collected, and what conclusions and recommendations were drawn from this information. Make sure all aspects relate to the subject of the current memo.

The *Purpose* and *Summary* should fit on the first page of the memo. For design memos these two sections will almost always take the entire first page.

Discussion

The discussion section of the memo provides a complete description of what the author has accomplished. In many cases this section will be longer than the cover sheet. Write this section first. Break it into clearly marked sections for the convenience of the reader.

Some possible subsections for the *Discussion* portion of the memo are:

- Background - What is known from previous work? What are the detailed objectives and why are they needed?

- Theory - What are the key equations that apply to the study? (Please use an equation editor.) Why are they the key questions for this work? What are the variables in the equation? What are the constants? What data was taken? Which parameters are fit to the data?
- Methodology - How was this study conducted? What were the experimental or analytical procedures used? What data were collected? How were the data treated? Figures of any experimental apparatus are included when appropriate
- Results - What were the results? Result section generally centers on figures or tables and their explanation. Sample calculations can be attached. Such calculations should show complete unit analysis for all variables. Computer calculations should be fully documented. Note: just including a raw computer output is **never** adequate.
- Alternatives – What alternative ways of meeting the purpose were developed? What are their relative strengths and weaknesses? When might one of these be considered over the main solution or solutions proposed?

In most cases “Discussion” is not used as the title for this section. Instead use the appropriate headings from the above list. The most common problem in the *Discussion* is that the author is not concise. However, this section must be complete while being concise.

Close

The closing section should focus on what should result from this memo. A summary of the entire memo is not necessary (that was done on the first page). For engineering memos this portion will most often be complete Conclusions and Recommendations sections. The actual title “Close” is almost never used.

A *Conclusions* section consists of a list of the key conclusions which can be drawn from this work. Are there any generalizations that can be deduced or inferred from the facts presented? What do the facts mean to the project? Most often these are presented as separate numbered sentences. Be clear and specific with each conclusion. All conclusions presented should follow from the earlier discussion.

A *Recommendations* section consists of a list of actions which should be taken as a result of this work. How should the presented information be used? What next step is needed and why? The most common error is that recommendations are not specific enough. Recommendations must be specific enough to implement. The recommendations are often ways to improve what is currently being done. “Improve” may mean make cheaper, faster, more reliable, easier, more appropriate, safer etc. For design memos the recommendations must include a clear statement of which design option should be built or a statement that no design should be built.

In some informative memos, such as this one, a closing section may not be necessary.

References

If reference is made to other publications the detailed information should be included here. References are used to provide direction to additional information and to give credit to others whose work has been incorporated in this memo.

Attachments

Refer to all attachments in the body of the memo. If they are not worth commenting on in your text, they are not worth attaching. It is helpful to include a list of attachments. Common attachments are graphs, tables, computer programs or program output, list of variables and meanings (particularly if computer output is also attached), statistical output, calculations to illustrate unit cancellation or other calculation details, and detailed experimental procedures. Attachments must be clearly organized. Raw data, raw computer printouts, hand calculations, etc should never be attached without clear presentation.