To: ME 2000 Students
CC: Professor Balaji
From: Communication Consultants
Date: 10/27/2004
Re: Written Proposals
Attachments: 1

The purpose of this memo is to provide an overview of the guidelines for writing a proposal, including the reasons proposals are written, the style for writing proposals, and the components of a written proposal.

Purpose
Proposals are written to suggest or sell a course of action or product or make a request for services, products, time or money. They are most often written by engineers when asking for funding for projects or attempting to sell products or courses of action to superiors or other organizations.

Components
A written proposal should include the following sections: cover letter, cover page, executive summary, overview of proposed solution, technical section, management section, time/cost section, experience and qualifications, conclusions and recommendations, and appendices (see attachment 1).

Cover letter
The cover letter introduces the proposal to the reader. It can address, depending on the relationship between the author and the reader, why the proposal is being sent, who the author and his/her team is or represents, and what problem or request the proposal will answer. It is generally not attached to the proposal or included in the table of contents.

Cover page
The cover page informs the reader of the title of the proposal (which orients him/her to the topic and the scope of the proposal), to whom the proposal is being submitted, the name of the company for whom the proposal is written, the name of the person who wrote the proposal, his/her affiliation, and the date it was submitted.

Executive summary
An executive summary is a short, one-page synopsis of the persuasive points of the paper. It will include a brief, one-paragraph summary of the problem/opportunity as the author sees it, a one or two paragraph summary of the proposed solution/product, and a one or two paragraph reinforcement of why the author’s solution or product is strong. (Think persuasion!) This is where you address your overall strategy for winning the competition as well as your target specifications.

Overview of proposed solution
This section includes first the general requirements needed to be met (from the author’s perspective) by the product or solution. It then offers a general explanation or description of the solution or product being proposed and how it will meet the requirements previously described. Finally, this section will preview what other sections will be included or expanded upon in the proposal.
Technical section
This section is a detailed description of the production/solution being proposed. This includes detailed explanations of the intricacies of the product/solution and the materials used to design the product/solution.

Management section (optional for this project)
Although this section may not be present in student proposals, it is generally used to introduce the management, the organization plan and approach, and the team who is working to complete the product/solution.

Time/Cost section
This includes a schedule and a budget. It is not sufficient to attach a GANNT chart and a spreadsheet. These items must be discussed like any other, identifying the important points of the two.

Experience and qualifications (optional for this project)
Again, this section may not be present in student proposals, but it addresses the experience of the team/researcher or the research put into the product/solution.

Conclusions and recommendations
This section may seem repetitive, but it serves to remind the audience of the important points of the proposal and again, very persuasively, explain why the author’s product/solution is the best choice for the reader.

Writing guidelines
When writing a proposal, there are some very important guidelines that must be applied to the style and format of your writing. Also, when incorporating visuals, special care must be paid to using them effectively.

Style
Because of their purpose(s), proposals are inherently persuasive. When writing a proposal, authors need to be constantly aware of their audiences and what issues need to be addressed in order to persuade them to agree with their perspective. Additionally, authors need to be aware of the level of topical information or education the audience has in order to address adequately answer any questions BEFORE they are asked. Finally, persuasive style involves a lot of repetition of salient points and the application of evidence to the point being made. Gentle reminders of pivotal information or persuasive points help the audience to see the issue from the author’s point of view.

Writing in engineering is most often done in the 3rd person. Technical writing should show confidence, which means avoiding use of words like might, could, maybe. Pronoun use should be limited to ensure that the reader is always clear about the topic (it to you may seem clear, but to the reader, it could refer to any of the 3 nouns that appeared in the previous sentence). Use bullets to highlight lists of information only. Chronological explanations of procedures are not lists and should not employ bullets.

Format
This technical writing project will use 12 point Times New Roman font, and be double-spaced with no indents beginning paragraphs. Bold major headings, underline or italicize subheadings. But, overall, be consistent.

Visuals
When using visuals in text, it is important to first remember to label all visuals as figure or picture 1. Second, visuals must have a specific purpose for explaining. In text, tell readers specifically what you want them to look at in the picture (Ex.: Please note the hinge joint in the left arm of the robot in Figure 1. This hinge was chosen because of its ability to...). If a visual is too large for a page or is so large that no text can accompany it, place it in an appendix (for further explanation, see Attachment 1).

Summary
Keeping in mind these stylistic and content guidelines for proposals, ME 1000 students should be able to successfully propose their projects.
The two used most at PARC are known as G2 and G1v4. The more powerful one, G2, is made of just two types of cube-shaped modules: a segment that has a hinge-joint between two hermaphroditic connection plates, and a node, which doesn't move but has six connection plates (see Figure 1). Most of the functions depend on the hinged segment, which produces the robot's movement, whereas the node's job is to provide branches to other chains of segments. In theory, with enough nodes and segments, PolyBot could approximate any shape.

![Figure 1 PolyBot G2 Front View](image)

The 25-cm² connection plate shown on this PolyBot G2 segment mates with an adjacent module. Infrared sensors align the modules for docking, and a latch made of shape-memory alloy holds them together. Holes and pins add stability to the connection, with power and data transmitted via electrical connectors. "Under the hood" where they can't be seen are the microprocessor and memory.

*Example taken from:* Yim, M., Zhang, Y., & Duff, D. (2002 March 5). Modular robots: When a task or terrain varies, reconfigurable robots can change their shape to get the job done. Xerox Palo Alto Research Center (PARC). Obtained March 5, 2002 from http://www.spectrum.ieee.org/WEBONLY/publicfeature/feb02/mrobo.html
When using visuals in text it is important to remember to:

1. Label all figures with Figure, Photo, Graph, or Drawing and a number or letter
2. Refer to the figure in text while one is discussing it
3. If the figure is complicated to comprehend visually, label the individual parts clearly
4. Discuss the figure and make a connection between your argument and the visual
5. Use clear drawings or figures