

Tips Help Engineers Write Well -- Part 1

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Many engineers see engineering and writing as mutually exclusive skills. They think people can do one or the other, but not both. Engineers can write well, although it takes some practice, following a few guidelines, and understanding how to organize information in a way that makes sense for readers. You'll quickly find writing forms an important part of an engineering career. Years ago I knew an engineer who thought he would spend his life in a lab doing research and manipulating numbers, so I tried to convince him of the need to communicate those numbers so others could make sense of his work. The message didn't sink in.

What type of writing might you have to do? How about lab reports, weekly or monthly reports to your boss, conference papers and presentations, magazine or Web-site articles, a story for a local magazine or newspaper, patent applications, marketing and sales information, application notes, grant applications, request for a raise, justification for a budget or a project, and so on? If you cannot express ideas clearly, your career might stall.

When I started my magazine-editor career at EDN in the mid '80's, I thought I could write fairly well. One of my editorial colleagues said she couldn't teach anyone over 40 to improve their writing skills. Thankfully I was 39 and caught on to ways to make my articles and columns better. Along the way many others contributed to my editorial "education," and I appreciate their help. Now, perhaps, I can help you write better, too.

My writing ideas in this column do not apply in all situations. Patent applications and journal articles, for instance, have their own styles and formats. That said, though, you still can become a better communicator. Let's jump in.

When people start to write they often make a critical mistake: they start with an outline or an abstract. Of course we learned that approach in school, but it seems a lot like plotting a vacation route without knowing where you want to go. Before you start a writing "project" you must have a clear set of objectives. A lab report might have one objective and an application note might have two or three. Years ago a series of electronics books from NCR included clear objectives at the start of each chapter and you can emulate that approach by writing your objectives in a format similar to:

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After reading my (memo, article, report...) you will know how to:

1. First objective
 2. Second objective
- ...and so on.

Or you might say, you will know about xyz, you will understand our research progress on Project 65R, you will understand how to calculate., you will know the implications of xyz., you will understand how to assemble an abc., and so on. I recommend a maximum of three objectives. Most people cannot absorb more information in one written piece. Often one dominant objective or theme suffices.

Then review your list of objectives to ensure you covered the key points and remove objectives that seem secondary or that just don't fit. Only then will you have clear goals so you can write an outline. Each section of the outline must support the objectives. If the outline's first draft includes extraneous or "background" information, remove it. Background information can go in an addendum or an appendix, but you might find you don't need it after all because you have written a good document as a result of starting with clear objectives.

Ask a colleague to review your objectives and outline and critique what you have done. A second pair of eyes can help you identify something you didn't include or explain, or something that just doesn't fit. When you have an outline that meets your objectives, you can create an abstract – if you need one.

When I explained this technique to an engineer at a semiconductor company, he said he could tell me his article's objective right away: Get a raise. That sounded like a good objective, but not a primary objective for crafting written material.

In the next step, gather the information you need to write your memo, report, or article. Just because you have information at hand doesn't mean you should use all of it. Most good writers include a small fraction of the "facts and figures" at hand. Everything in your document must support the original objectives and fit into the structure of your outline. As you gather information, feel free to rearrange and modify your outline. Things that seemed important at first might get overtaken by other information. Also revisit your objectives to ensure they still make the points you want to emphasize. Again, do not add information just because you have it.

In the next column I explain how to arrange the pieces of a document so they have the greatest effect on your reader, and my tips just might take your ideas about writing and turn them "upside down."

Reference

Zinsser, William, "On Writing Well," Harper Perennial, 2006. ISBN: 978-0060891541.

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