

# How to Prepare a Good Technical Presentation

Simplification is the key

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**T**he ability to communicate is a major part of your success as a designer, researcher, or contractor. It's a good way to make yourself known among your peers and potential clients. Communication skills include the ability to write reports and give oral presentations. In the end, it doesn't matter how good you are technically if you can't get your points across. In 2001, we described how to write a good technical paper.<sup>1</sup> Our goal here is to describe how to give a good technical presentation.

A good presentation is fundamentally different from a good paper. If a reader's attention lapses or they don't quite understand something, they can reread the paragraph—several times if necessary. A listener has only one chance to get the information. As the speaker, you must hold the attention of your audience; once you lose them, they're gone for good. The need to maintain their attention affects the type and amount of information you can present. Complex or detailed information does not lend itself to oral presentation. Stick with the basic concepts and let people read about the details in your paper.

Giving a technical presentation is a skill that must be learned by observing others and, most of all, by doing. The more you do it, the better you get—that is, if you know what to do. In this article, we'll give you a few pointers on how to organize your talk, plan your slides, rehearse, and make your presentation.

## ORGANIZING YOUR TALK

When organizing a talk, you need to decide what points to include and how to approach the subject. As you take this step, make sure to consider your audience. It's important to tailor your presentation for the group

who will actually be listening to you. Who are they? What are their concerns? What do they hope or expect to gain from listening to your talk? What do they already know or believe about your subject matter? Do they already know you, or do you need to establish rapport or credibility with them first?

Consider the educational and professional background of your audience so you can use language and illustrations they understand without talking down to them. Remember, you are the expert and the audience members are not, but the gap between you and the audience may be wide or narrow. For this reason, make sure to plan your talk to first bring the audience up to speed so they understand why the topic has significance for them. You may have to explain some specialized terms, but try to avoid excessive jargon. In the process of deciding what to say, separate what's important from what's not. It's helpful to remember that most detail can be left out.

You should also consider why you are giving your talk. What do you want the audience to do with the information you present? The kind of information you present and the way you present it will be very different if you are presenting your research at a highly specialized technical conference, giving a talk at an ACI convention, helping schoolchildren with a science project, teaching undergraduate engineering students, testifying at a public hearing, or explaining your findings to a jury. In some cases, you'll need to take the time to build credibility with your audience or get them to identify with you before beginning the technical portion of your presentation.

Once you've decided what to present, plan your presentation. Remember that a talk should have an

introduction, a body, and a summary or set of conclusions. Make sure that your presentation is well organized and flows logically. An old hand in the business would often say, "Tell them what you're going to tell them, then tell them, then tell them what you told them." The repetition helps the audience remember the key points. It's also a good way to set the framework and let the audience know that you *do* have a plan, that is, you're not wandering aimlessly from one topic to another.

Within that framework, you may need to have some additional structure. For example, you should describe a case study or an experimental procedure in chronological order. Some topics might be better described by going from the big picture to progressively smaller detail, and then back to the big picture to show how it all fits together. Other good ways of structuring your talk may occur to you. Be sure to let your audience know how you've organized it so they know what to expect. If your talk is long or the structure is complicated, you may want to show your audience the outline between sections as well as at the beginning so they know where you are.

### SIMPLIFY GRAPHICS

It's best to plan technical presentations around graphics. Pictures are easier to follow than words or equations, and it's easy to see the relationships between quantities. Most people also find graphics more interesting than words.

Slides, such as those you can prepare with PowerPoint®, will be central to your presentation. As you prepare your slides, the key rule is to make them bold, clear, and simple. If at all possible, stay away from equations. If you need equations, limit the number to one, or two at most, and simplify them as much as possible. To hold the interest of your audience, vary your slides so they don't

all look alike. In particular, don't overuse word slides. Pay attention to color contrast. Some color combinations are very difficult to see, especially when the room lights are not turned down all the way. White lettering on a blue background is usually easiest to read.

If you're using overhead slides, make sure the font size is large enough to be read from the back of the room. Overhead slides can be produced by a computer or they can be hand lettered, but the same rules apply.

Don't show a lot of tabulated data (Fig. 1). It's best to show only the data of interest, as illustrated in Fig. 2. In any case, graphs are usually a better way to present data, particularly to engineers.

When using graphs, remember to make the letters and numbers large enough to be seen clearly from the back of the room. One or two curves on a graph are usually all you'll want to use. As with all slides, the rule is to use plots that are clear and bold. Graphs that appear in publications often have too much detail and lettering too small to be easily understood by the audience, especially in the few seconds that the slide will be on the screen. For example, compare Fig. 3 and 4 for clarity, and imagine that you have only 20 seconds to absorb the information.

Beware of excess detail. Remember that your audience will retain only a limited amount of information. Don't confuse them with data or detail that isn't needed to understand the major concepts.

PowerPoint® has some features that can enhance your presentation if used judiciously. Animating your slides can help the audience focus on what you're talking about. In the simplest form, animation can be used to "build" slides so your bullet points appear one at a time rather than all at once. You can add curves to your graph one at a time so it's easier for the audience to see the differences between them. Animation can also be used to good effect

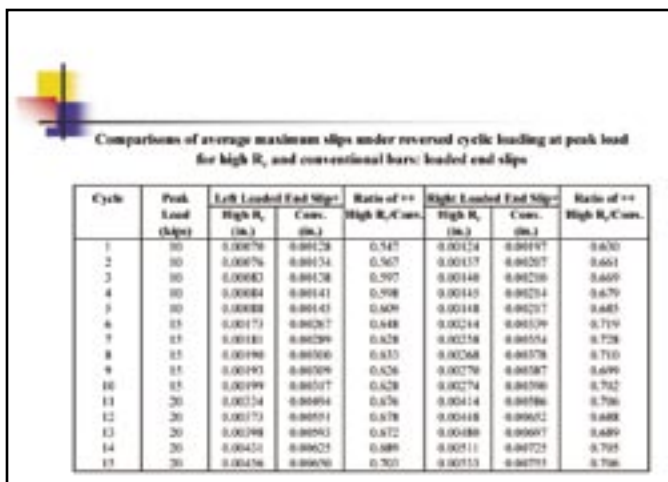


Fig. 1: Slide with tabulated data—not recommended for use in technical presentations

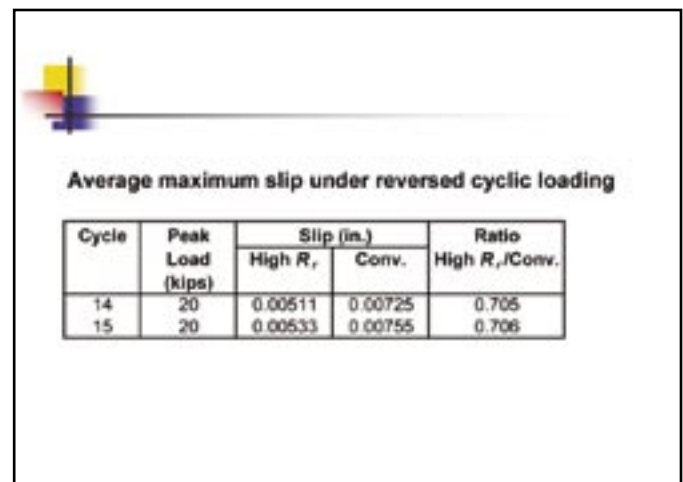


Fig. 2: Slide showing just the data of interest—easier to pick out the main points

to show a progression, such as crack formation and growth, but be careful not to let the special effects dominate your presentation. Skip animation of background or highlighting features since they invariably detract from the information you are trying to convey.

Object lessons, practical examples of a principle or abstract idea, can be very effective in adding interest to your talk and making complex ideas both accessible and memorable. One author used a soccer ball to explain the stereological properties of air voids in thin section. Another author has used candy bars to illustrate the difference between plastic and drying shrinkage in concrete. As with special effects, make sure the object lesson enhances rather than detracts from your talk. Your object must be easily visible from the back of the room. Also, you'll need to allow enough time to demonstrate your point. Be sure to rehearse your object lesson thoroughly so you know how long it takes and how to make it go smoothly.

If you're asked to speak on the same subject to more than one audience, you still need to tailor your talk and not simply repeat it to each new audience. Of course, you'll be able to reuse many of your slides, but you should consider each audience individually. Is there a local issue that needs more emphasis? Can you use a local project to illustrate your point? Is there a local expert you should acknowledge? Can you update your information? Out of consideration for your listeners, avoid giving a "canned" presentation—try to make each one fresh.

## REHEARSE

Because it's during rehearsal that you will actually decide what you're going to say and how you'll say it, we can't say enough about rehearsing your talk. To start, place your slides in the desired order, and find a quiet place

where you won't feel self-conscious as you begin to rehearse. Initially, lay the slides out or have them arranged on your computer screen so you can see several at a time. Begin your rehearsal while looking at the slides. As you become more comfortable with your presentation, set up your computer or stack up your slides so you can see only one at a time. Your goal is to know your slides so well that you know the next one that's coming up.

If you're an inexperienced speaker, you should do some of your rehearsing in front of a mirror. Check yourself for distracting mannerisms. A tape recorder can help you spot speech mannerisms such as excessive throat clearing and "fillers" such as "uh" and "you know." If you have a couple of friends who are willing to be a practice audience, try out your talk on them and solicit their comments. Some universities and businesses have department seminars that can be used to practice technical talks.

It's best to use the slides as your notes. While it's okay to use supplementary notes, you'll look more professional if you can give your talk without referring to cards or sheets of paper. Remember that you'll most likely have a laser pointer in one hand and a remote in the other. It's too complicated to try to juggle notes along with them. The best speakers don't read from a script, and it's not a good idea to read the slides. You should speak directly to your audience. Work toward freeing yourself from the slides so you only need to glance at them to know what you want to say.

If you are not a native speaker of the language in which you will give your talk, be aware that in your nervousness you may forget key words. It may be helpful to use more words on your slides so that all the key vocabulary is there in case you forget. To avoid cluttering your slides, you may need to use a few more slides than you otherwise would.

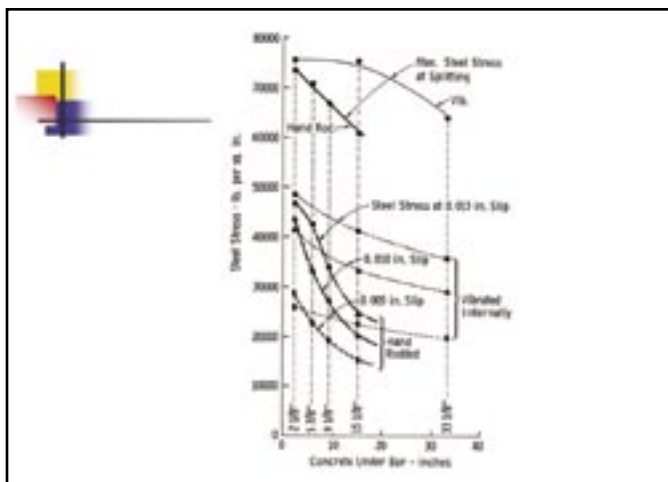


Fig. 3: Slide with graph as it appeared in a paper. It contains too much detail for a presentation. (Original figure from Ref. 2)

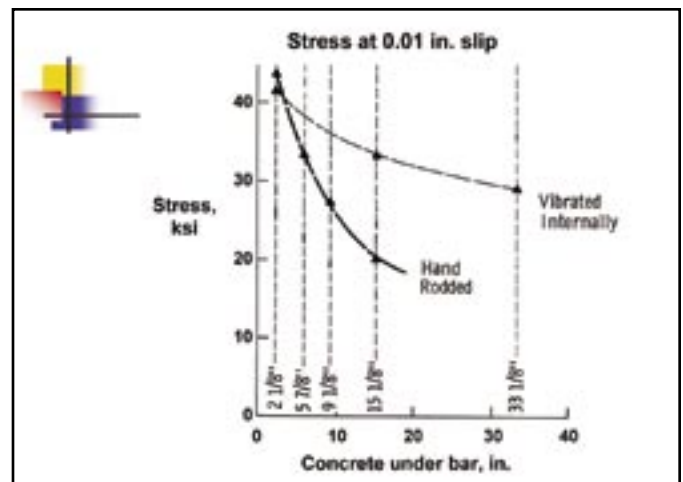


Fig. 4: Slide with graph modified for ease of understanding during a presentation

As you rehearse, you'll find that some slides will need modification (this can be easily handled if you're using PowerPoint®), some slides will need to be added, and some slides may need to be dropped. Each time you rehearse, keep a record of the time and watch the trend. A typical guide is one slide per minute, with a minimum of 20 seconds; this will vary, and each speaker has their own style. Some speakers use the slides to tell most of the story. That approach usually translates into more slides, with less time per slide.

## PRESENTATION

The number one rule in making a presentation is to get there early—with your slides. When you're traveling, especially by air, don't check your slides, computer, or disk if you need them for the presentation. If possible, e-mail or send a disk with your electronic file to the organizer of your session so it can be already loaded onto the computer you'll use. But be sure to carry a backup disk, and check to make sure you have the right format.

When you arrive for the presentation, make sure that your slides project properly using the equipment available, and check out the lighting, microphone, sound system, and layout of the room.

When you make the presentation, face and talk to the audience. Be enthusiastic, and—we can't emphasize this too much—*finish on time*. We'll bet that *your* favorite speakers are those who finish on time or a little early. If your talk is part of a technical session, timing is critical. People often need to move from one session to another to hear the presentations they're interested in. If you talk too long, you disrupt the schedule for the remainder of your session. If you end a little early, you can always answer questions from the audience.

When making a successful technical presentation, one of your goals should be to sell your information to the audience. Another goal should be to sell yourself—your expertise, your credibility, your professionalism. The two goals are not mutually exclusive. Therefore, to make a good impression, if there is any question on what to wear, dress up a little bit. Usually, business attire is most appropriate. You can feel sure that no one will think badly of you for doing so. Even if the audience is casually dressed, your more formal dress shows respect for them and for the occasion.

Humor is a good way to build rapport with your audience—or alienate them altogether. Be aware that humor is peculiar to a culture and sometimes to a particular demographic group within a culture. If your audience represents a mixture of ages, sexes, ethnic groups, political parties, regions, and nationalities, it can be difficult to find humor that everyone appreciates. In that situation, cuteness usually works better than wit. "Far Side" cartoons are often successful with a variety of audiences. North American audiences generally do not like sarcasm or any "humor" that denigrates someone. If in doubt, it's better not to include

humor at all than to tell a joke that your audience doesn't "get," or even worse, one that they find offensive.

If you are giving an after-dinner presentation, recognize that your audience is most likely not prepared to listen to a long, highly technical talk after eating and drinking following a full day of work or travel. Make a special effort to keep your remarks lively, interesting, and—above all—brief. Avoid alcoholic beverages before speaking. You need all your inhibitions intact to keep you from saying things you shouldn't and to prevent you from droning on too long.

## SUMMARY

The ability to give a good technical presentation is an important skill for designers, researchers, and contractors. It's a skill that must be learned, and therefore, it must be practiced.

Remember to tailor your talk to your audience, plan your talk and your slides, rehearse so you will know what you want to say, and make sure to tell your audience what you are going to tell them, then tell them, and then tell them what you told them.

## References

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