Engineering and Scientific Presentations

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Prologue

Prior to his untimely death, Michael Jackson was in rehearsal for an upcoming tour titled *This is it*. The preparation for the tour is the subject of a video documentary of the same name. One of the striking impressions to be taken from the coverage of those rehearsals is that Michael Jackson was never satisfied with *good enough*. Here was an individual who could have walked on stage and done practically anything to the delight of his adoring fans, but there was no sense of self-satisfaction or complacency in his approach to preparing for this tour. He paid attention to everything, pursuing improvement wherever possible. It seemed he wanted his own performance and the performances of his supporting cast to be beyond anything that had gone before.

Why Present?

An engineering or scientific presentation is a performance. When you present, are you satisfied merely by getting through this performance or do you want it to be as good as you can make it? For many of us in the engineering and scientific professions, presentation at a conference is generally a choice; it is rarely a required duty of our employment. Why do we volunteer for that? For some, it comes down to an expenses-paid visit to another city, possibly even another country. However, for others, it is a matter of professional pride. We think the work we are doing is significant and we imagine others will benefit from knowing about it. If you fall into that group for whom this is a matter of professional pride, read on.

Beyond performance, a presentation is an exercise in communication. If you are to make a presentation, you would, at the very least, hope that those listening to you will understand what you have to say. Additionally, you might anticipate they would believe you and that they would find what you say to be of value. You might think that is enough. Surely, it would be too much to ask that they would enjoy your presentation and possibly even leave feeling that they had been privileged to hear you speak.

It can be a long way from that first presentation, where you count success as stumbling through without suffering a heart attack, to that point in your life where you confidently anticipate that your audience members will enjoy your presentation and will be interested in what you have to say. You will, of course, improve in your presentation style merely through repeated experiences, but if you are to reach a high level of performance, you must, as a first step towards developing a style that is fresh and invigorating, reject much of the dogma that surrounds our current professional approaches to presentations. There is much I could say about what is wrong with current approaches, but more to the point, what is an effective approach?

Content, Strategy, Style

As depicted in Figure 1, an effective presentation is based on content, strategy and a style. Each of these three dimensions is critical; if any one leg fails, the presentation as a whole will fail.
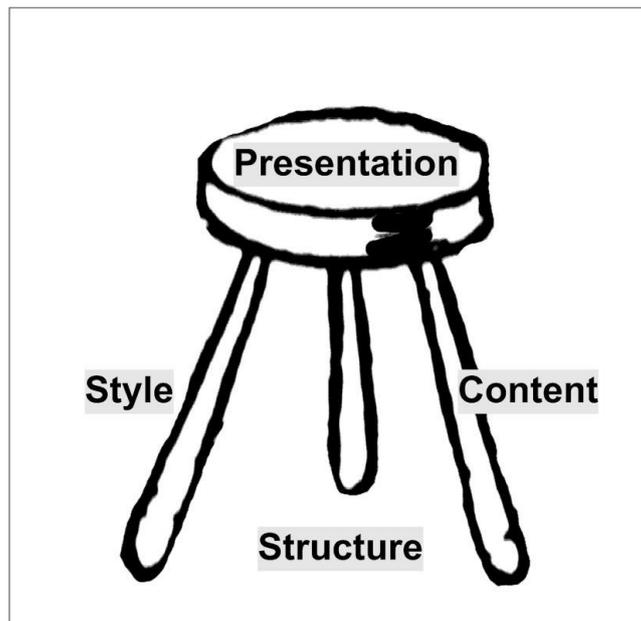
Figure 1: An effective presentation relies on content, strategy and style

Content

Although I have asserted above that a presentation is a performance, it is a special-purpose performance. Its purpose is communication, more specifically, communication of ideas. An effective presentation has content; it offers information that is of substance and is of value to members of the audience. For most of us, this is the easy part. It is rare for an engineering or scientific presentation to lack content. Most of us have more than enough ideas and rather than a lack of content, the most frequent content-related problem is one of too many ideas.

Structure

Whatever the content, a presentation should provide information in a manner that enables audience members to understand, assimilate and remember the key points and the argument. This is where too much content can get in the way. Remember that a presentation does not substitute for a technical paper on the same topic. It does not have to (and should not) include all of the technical details of the work. Ideally, there will be an accompanying paper and your audience members can go to that for those details. Nor should you model the structure and flow of your presentation on the required structure and flow of a technical paper. A presentation should introduce a small number of important conceptual ideas and link them together in a meaningful narrative. The presentation offers an opportunity to generate interest in your work and to raise the awareness of your audience members to the key issues.

Style

Finally, an effective presentation has a narrative style that encourages audience members to pay attention and to engage with the issues as you develop them. Here is where you can benefit by attention to some of the strategies used in theatrical performances. You do not have to perform Michael Jackson's *moonwalk* and indeed, such a display would serve you well only in the most unusual of circumstances. You do, however, have to offer a coherent narrative. It should have a

beginning, middle and end. In engineering and scientific presentations, we might think of these as an introduction, a narrative, and a conclusion. There must be a flow to this; the issues raised in the introduction should be dealt with in the narrative and resolved in the conclusion. The flow of your treatment of the issues through these three stages should be clear and explicit.

Malcolm Gladwell is very good at this (e.g., Gladwell, 2008). He introduces a mystery and then uses his narration to describe details of the situation surrounding it. By the time he gets to the solution, his audience is primed to recognize his answer to this previously puzzling mystery as obvious. But possibly of more significance is that Malcolm Gladwell has a presentation style all his own and it is an engaging one. It could be said that Malcolm Gladwell has found his *voice*.

Meta-Cognition

The term *metacognition* refers to our cognitive appraisal of our own cognitive performance. It is as if we are outside ourselves, observing how well we are doing and thinking about how we might do better. Within our cognitive capacity, those processes that support metacognition compete with other processes that support normal cognition. Especially early in our experience of presenting, we are unlikely to have sufficient spare cognitive capacity to engage in the meta-cognitive work of assessing how well we are doing. As in early encounters with any other high demand situation, it is sufficient to survive.

Nevertheless, if you are to develop a high level of competency in anything, metacognition is important. You are your most effective critic. If you can evaluate your own cognitive performance as you engage in cognitive work, you will see how you can improve. And so, if you are to improve as a presenter, you must at least get to that stage where you can reflect on your own performance during or at least soon after your presentation. If you are struggling with presenting in front of an audience, that should be your first goal.

But remember, this is not easy. It takes work. In his memoir (Martin, 2008), Steve Martin, now one of the best recognized comedians in the US, speaks of the years he spent struggling on the comedy circuit, refining his act. He set a deadline, at which time he would quit comedy if he had not succeeded. In fact, he did not meet his self-imposed deadline but continued nevertheless. Now, seeing him in action, it is difficult to imagine that he was not always outstanding.

Concluding Remarks

I have not, in this brief paper, mentioned in any systematic way, things you should do or should avoid. Much has been said about content, structure and style in at least a few excellent books on presentation and in quite adequate detail (Atkinson, 2007; Reynolds, 2008; Weissman, 2006). My personal favorite is *Presentation Zen* by Garr Reynolds. Additionally, much has been said about the failings of PowerPoint (Hammes, 2009; Tufte, 2003) or, more generally, slide-ware. However, the problem is not that we use slide-ware but rather, about how we use it.

As you read these books and papers, one thing that will become obvious is that relatively few presenters at engineering and scientific meetings follow the recommended strategies. Some native speakers of English offer excellent presentation models but it is a regrettable fact that most are just plain awful. While the authors of the books and papers I cite in the preceding paragraph could hardly be accused of radicalism, the strategies they recommend deviate markedly from the strategies that now dominate. What this means to you is that you cannot learn to be a good presenter by observing your peers or by adhering to standard practice. The books I cite offer an excellent introduction to developing a better way that does not follow the normal, stultifying strategies.

However, even when you get all of book learning right, you still have to practice. Create opportunities to develop and rehearse presentations in front of others. Try to avoid the situation in which the first

time you present your material, you are in front of your intended audience. Remember Steve Martin and Michael Jackson. Steve Martin struggled for years to get his act working and as accomplished as he was, Michael Jackson's rehearsals were intense, arduous and repetitive. If you are to do a good job of this, you also must develop your act and once you have it, you must rehearse. To do those things, you must first achieve a level of competency at which you can appraise your own performance.

If you are struggling with this, you may need practice and encouragement within a non-threatening and supportive setting. My workshop is specifically designed to give you that.

My workshop offers some didactic material on best practice, none of which departs substantively from the recommendations of Atkinson (2007), Reynolds (2008) or Weissman (2006). The added value of my workshop is that most of the two days is devoted to presentation development and rehearsal in an interactive setting. Delegates are given multiple opportunities to present in front of a supportive audience and to get feedback from fellow delegates and from the course instructor. The goal of this course is to move delegates from that place where presentation is a highly anxiety provoking experience to one in which they can be at least comfortable and can deploy those macro-cognitive evaluative processes that are essential to progress towards excellence. The ultimate goal, probably not fully realized immediately after this course, is that delegates will come to enjoy and value those brief periods the spend standing in front of an audience to explain their work.

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