

IEEE PCS Professional Engineering Communication Series

Traci Nathans-Kelly, Series Editor

Slide Rules

*Design, Build, and Archive
Presentations in the Engineering
and Technical Fields*

Traci Nathans-Kelly • Christine G. Nicometo



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To our families

A Note from the Series Editor

First of all, in the interest of full disclosure, I must point out that I am not only the series editor, but I am also one of the authors of this work. That said, let us get to the business at hand.

The IEEE Professional Communication Society (PCS), with Wiley-IEEE Press, continues its book series titled *Professional Engineering Communication* (PEC) with *Slide Rules*, which is an examination, re-evaluation, and a collection of insights about best practices for engineering, technical, and scientific presentations. Acknowledging that presentations are at the core of how much technical work is communicated, both at the academic and professional levels, this book takes aim at embedded presentation practices that are less than ideal, offering some techniques that can be shared, adapted, and adopted to specific technical communication needs. Some of the techniques may look unorthodox, but remember this—they work.

Following in the tradition of revisiting beliefs and myths about presentation practices, especially those that use slideware such as PowerPoint® and Keynote®, this book builds on the work of other presentation gurus such as Cliff Atkinson, Nancy Duarte, Garr Reynolds, and Edward Tufte—but the focus here is on the specialized tasks required of technical presentations, not business or marketing (but the practices here work well in all realms). As well, the information herein about memory and cognition is informed by recent findings in cognitive science, and the examples are true-to-life ones, gleaned from the conversations we have daily with the practicing engineers we work with. You will find the needs of technical professionals, such as the

element of documentation for postmeeting needs or legal issues, are also addressed.

I want to back up a bit and talk about this new PCS-sponsored project. As a series, PEC has a mandate to explore areas of communication practices and application as applied to the engineering, technical, and scientific professions. Including the realms of business, governmental agencies, academia, and other areas, this series will develop perspectives about the state of communication issues and potential solutions when at all possible.

The books in the PEC series keep a steady eye on the applicable while acknowledging the contributions that analysis, research, and theory can provide to these efforts. Active synthesis between on-site realities and research will come together in the pages of this book as well as other books to come. There is a strong commitment from PCS, IEEE, and Wiley to produce a set of information and resources that can be carried directly into engineering firms, technology organizations, and academia alike.

At the core of engineering, science, and technical work is problem solving and discovery. These tasks require, at all levels, talented and agile communication practices. We need to effectively gather, vet, analyze, synthesize, control, and produce communication pieces in order for any meaningful work to get done. It is unfortunate that many technical professionals have been led to believe that they are not effective communicators, for this only fosters a culture that relegates professional communication practices as somehow secondary to other work. Indeed, I have found that many engineers and scientists are fantastic communicators because they are passionate about their work and their ideas. This series, planted firmly in the technical fields, aims to demystify communication strategies so that engineering, scientific, and technical advancements

can happen more smoothly and with more predictable and positive results.

Traci Nathans-Kelly, Ph.D., Series Editor.

Acknowledgments

We owe thanks and recognition to many people and organizations who have contributed their thoughts, ideas, challenges, and expertise toward the information in this book. To begin, we thank Wiley-IEEE Press for its support. More specifically, the Professional Communication Society of IEEE deserves praise for its pursuit of a book series that reflects and encourages thoughtful exchange of ideas about engineering and technical communication. As the series took form, Helen Grady and Muriel Zimmerman spearheaded the vision for the series overall. Now in place, both the series and the authors of this book owe thanks to Mary Hatcher at Wiley-IEEE Press for her constant support, great advice, and staunch advocacy. Others at the Press who have been of great help and astute guidance are Kenneth Moore, John Anderson, Lani Angso, Taisuke Soda, and Timothy Pletscher.

Over the years, we have been recipients of fantastic opportunities to work with dedicated faculty, staff, students, and colleagues in the engineering and technical fields. Many of our insights were gained from working with the Masters of Engineering in Professional Practice (MEPP) and Masters of Engineering in Engine Systems (MEES) degrees at the University of Wisconsin-Madison. Wayne Pferdehirt and Sandra Anderson, directors of those programs, have supported our work for years and still encourage us to spread the word at every level. We owe a great debt of gratitude, too, to the many students/colleagues in those programs who are practicing engineers, technical experts, and engineering managers. Through honest conversation, deep discussions, and analysis of purpose and process, they have educated us as much as we have provided instruction

to them. Their willingness to share, quite candidly, their communication experiences within their organizations informs our positions greatly.

In our teaching lives, we spend a great deal of time with upper level undergraduates as they prepare to enter their professional careers. While we get them ready to excel in those careers, we also challenge them to change many of the practices they may encounter. We are excessively proud of the boldness, courage, and insights they have demonstrated both in our classrooms and as they venture beyond into their working lives.

In pursuing this work, we have found many kindred spirits who are just as—or more—passionate about powerful public speaking as we are. Michael Alley, in particular, has been gracious and supportive with his research and insights. Daily, others in hallways (real or virtual) contribute to our work: Sandra Courter, Rick Evans, Michele Kaiser, Paul Miller, and Larry Rose. Others who provided advice, insights, slide ideas, editing, and additional support include John Alsop, Jos Dings, Samantha Ebertowski, Geoff Goll, Marty Gustafson, Greg Lagenfeld, Lawrence Lessig, Annette Markham, Doug Medley, Luc Mertens, Phil O’Leary, Steve W. Paddock, Katie Pawley, Matthew Reddick, Doug Reindl, Marielle Risse, Britta Rowan, Tyler Schmitz, Don Schramm, Matthew Sinclair, Thomas Smith, Dustin Spencer, Anthony Sprangers, Ross Stein and his team of researchers, Shinji Toda, Willis Tompkins, Ron Ulseth Sr., Ellyn Underwood, Carl Vieth, Loren Welch, and Julie Wong. We also appreciate all of the subject matter experts cited in this book for their insightful work, upon which we build.

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Association, Autodesk®, Prezi®, and 2Screens®. Pictures not otherwise attributed were purchased from [iStockphoto.com](https://www.iStockphoto.com). Slides were created, unless otherwise noted, in PowerPoint and/or Keynote.

And, of course, we cannot forget our spouses—Ryan Nicometo and Steve Nathans-Kelly. They have listened, contributed, read, edited, and made possible the days we called “book camp.” We could not have done this without their patience, perceptive comments, and expertise. Our kids deserve a bit of praise, too, for letting their mothers work during odd hours, vacation days, and other times when we should have been playing with them. Henry, Emilia, and Luca, we love you.

Foreword

A small but significant revolution is occurring in the way that technical professionals are designing slides to support their presentations. Presenters in this revolution are rejecting PowerPoint's default structure of a topic-phrase headline supported by a bulleted list. Instead, for their talks given in industry, at conferences, and in classrooms, these presenters are opting for scenes based on message headlines supported by visual evidence. *Slide Rules* by Traci Nathans-Kelly and Christine Nicometo places you on the leading edge of this revolution.

Many engineers, scientists, and managers mistakenly assume that presentation slides are not that important. However, the design of slides affects the success of a talk in three important ways. First, slides affect how the speaker prepares the talk. During the slide creation phase, the presenter decides what details to include and, especially important in a technical talk, what details to leave out. In most technical talks, presenters insert too many details, usually at the expense of the audience recognizing what truly is important. Slide Rule #2 teaches you how to filter out the secondary details that drown so many technical talks. This rule also teaches you how to focus on your key messages.

A second way that slides affect a presentation is how the speaker delivers the talk. As Slide Rule #1 points out, many technical presenters infuriate audiences by projecting way too many words. Nathans-Kelly and Nicometo capture the essence of this problem—presenters use slides as a teleprompter, while the audience struggles in vain to read everything projected and listen to everything said. By

relying on Slide Rule #3, you can avoid this common “death-by-PowerPoint” delivery.

Perhaps the most important effect, though, that slides have on the success of a technical talk occurs in how much the audience comprehends and remembers. My research team has found that using an assertion-evidence approach, which Nathans-Kelly and Nicometo advocate, will lead to significant increases in audience understanding of the presentation’s technical material. If the situation were a classroom, the increases would be a full letter grade or more. Moreover, the more technical the content, the greater the increase is. Think about that for a moment. Imagine that you are presenting an important proposal to a client or important results to managers. If a way existed for you to increase your audience’s understanding of your messages greatly, would you not seize it? Following the principles of *Slide Rules* allows you the opportunity to do so.

Several good books have recently come out about making presentations, but *Slide Rules* stands out because its advice targets technical presentations. In addition, the examples supporting that advice arise from actual technical presentations in industry and research. In other words, the examples are not theoretical oversimplifications. These examples carry the cachet of having succeeded in actual boardrooms and conference sessions. Moreover, these examples cover a wide range of topics—from shape memory alloys to embryonic stem cells to modeling of tsunami waves. No matter what area of engineering and science you work in, *Slide Rules* will have examples that parallel the communication hurdles that you face.

In addition to targeting technical presentations, *Slide Rules* stands out because it covers so many issues about slides. In fact, this text covers more of these issues than any book I know. For instance, with Slide Rule #4, the book’s advice goes beyond how to create slides that succeed *during* the

presentation to the important issue of how to create slides that also succeed *after* the presentation. In industry, a major hurdle for the acceptance of slides that follow psychology principles for how people learn is the misconception that the projected slides must stand alone as notes. *Slide Rules* challenges this misconception and shows you multiple ways to use the Notes pages to archive the presentation.

What most separates *Slide Rules*, though, from other books is that its authors have tested their advice in the trenches of industry. In fact, the book's side bars aptly carry the tag "From the Trenches." And these two authors in their teaching of technical professionals clearly have been in these trenches. Not only do they understand what slide designs succeed in communicating engineering and science, but they understand how to adapt these slide designs to different companies and laboratories. In particular, Slide Rule #5 tackles this issue. I cannot tell you how many of my own students have created effective slides, only to be thwarted by a company template dedicated to bullets or a narrow-minded supervisor insisting on the status quo. For those students, I now can recommend this book with its wealth of "been there, done that" strategies.

A revolution is brewing in how engineers and scientists present their work, and at the heart of this revolution lies a rethinking of failed strategies for visual aids. Those who ignore this movement will walk one day into a business meeting or conference session and realize that they have been left behind—perhaps not this year and maybe not even next. However, a decade from now, this revolution in slide design will become the expectation. Traci Nathans-Kelly and Christine Nicometo understand this revolution, and their book enables engineers and scientists of today to incorporate the presentation styles of tomorrow. In this fight to raise the level of engineering and scientific presentations, I am a relatively old dog. However, *Slide Rules* has taught

me more than a few new tricks. I am honored to have my research cited in this book. *Slide Rules* sits on my desk, and I strongly recommend that it sit on yours.

Michael Alley
The Craft of Scientific Presentations
Engineering Communication, Pennsylvania State University

Introduction

Slide Rules is a book that we hope will encourage change in current engineering, technical, and scientific presentations. It is not a book that promotes ideas that are untested, unrealistic, or dreamy-eyed. This is a book about techniques—tested in engineering companies, scientific endeavors, and businesses—that also work wonders in classrooms. The ideas here are rooted in the very realities and constraints that professionals face each day. It is a book that will ask that presenters reclaim the stage, move slides into strong support positions, and give voice back to the subject matter experts.

We understand that the techniques here may challenge current presentation traditions, but we also know that technical practitioners always seek best practices. In that spirit of constant innovation, of finding the best solutions for complex problems, we hope that the readers of this book put the techniques in these pages into action, transforming the very way that work gets done and communicated.

Do not be daunted by what you see in this book. We use no fancy software to make any of the examples. You will not need a design degree to make it happen. For this book, we use only PowerPoint® and SmartArt®, Keynote®, and a few basic tools inside those programs such as animations, shapes, and cropping. You will also see technical output from other programs (CAD, statistical analyses, etc.) that have been inserted as simple pictures. Fear not: you will be able to master those basic slide manipulation functions in a small amount of time with great outcomes.

Understand our path to these techniques

As teachers and consultants, we have a unique window into engineering and technical presentations. And while our impulse to change presentations came from teaching undergraduate engineers, it is informed greatly by our work with practicing engineers, already out in the field.

The story of our own journey toward these techniques started with what we saw happening with undergraduate engineering students. As communication instructors in engineering colleges, we were pummeled each semester with hundreds of presentations. They were often nothing more than projected cue cards, dense with text, accompanied by a monotonous voice slogging nervously through each typed point. These performances were not solely the fault of the students; they were doing what they had been taught. Our students complained bitterly about the slide presentations they were subjected to in lectures each semester, yet they also mimicked those practices as they entered their fields because they had no other models. Looking back on our own slides from a decade ago, we were just as guilty as anyone in the overuse of bullets. As much as we appreciated the hard work that the students were doing, we just could not watch any more of these terrible talks. Something had to change.

In the next chapter of the tale, our teaching was transformed when we began instructing graduate students. These were not the usual set of engineering graduate students; they were all practicing engineers returning for their degrees. At the University of Wisconsin-Madison, the Masters of Engineering in Professional Practice and the Masters of Engineering in Engine Systems degrees accept only students who are at least four years into their career

paths. Necessarily, because the student-practitioners have to stay on the job, these are “online” degrees, with a residency component each summer.

Here is the best part: these student-practitioners can take what we teach them, enact it at work, and report back (sometimes even the same day) if what they have learned works. This is an incredible and unique situation for engineering instructors, and it has contributed greatly to the techniques we honed and share with you herein.

When we began thinking about the alternative models for presentation practice that are now housed in this book, truthfully, we were working in self-preservation mode. We saw hundreds of engineering presentations a semester (undergraduate, graduate, and professional), and the overuse of bullets was killing us. So, we began to require changes in our classes to help us get through our days. Fewer bullets, please. More pictures. Better graphs. Or no slides at all.

We found and came to know well Michael Alley and his colleagues, whose early work, founded in engineering fields, broke new ground. He promoted sentence headers and visuals as supporting evidence [1-6], which are true compliments to how engineering and technical work functions during presentations. We found other communication gurus such as Cliff Atkinson [7], Nancy Duarte [8], Garr Reynolds [9], and Edward Tufte [10] also encouraging speakers to avoid using bullets as the default. And while we agree with those experts wholeheartedly, their books also have a decidedly marketing and business angle to them. Our technical students reported that they liked the ideas in those books, but they were just too flashy, too removed from the realities of their on-site audience needs. Thus, we began to adjust the concepts, applying them to engineering, science, and technical circumstances.

Witness the change

The adjustments we asked our undergraduates and graduate student-practitioners to make worked beautifully. The transformations were powerful. Speakers once again felt in charge of the material instead of being beholden to a script on the slides. They became engaged again with their own content, and they presented with passion, vigor, and rigor. We heard, again and again, statements of regret from our graduate professionals that they had not learned these presentation designs much earlier in their careers.

At first, we asked for the smallest of changes, usually starting with the use of sentence headers that work wonderfully as small executive summaries for each slide (see Chapter 5). Sentence headers allowed speakers to thread an executive summary through their presentations, thus addressing the increasing need to brief a higher-level audience through presentations without getting bogged down in implementation or process details [1-6].

Next, we began to help our colleagues in the technical fields to lighten their bullet load, asking for more visuals, the use of better charts, and a paring down of detail in order to target material intentionally (see Chapters 6-8 for some examples).

Last, as part of this journey, we had to tackle the reality that slides have become ubiquitous in the current organizational communication patterns. The practicing engineers stated that colleagues inside their organizations used slides as reference material. We learned much from those engineers and technical specialists about the true life cycle of slide decks; slides are not only visual backdrop for speakers, but they are also the vehicles (far too often, most likely) for legacy pieces, archival efforts, and communication between teams, management, and clients. And while the old-style bulleted slides had more words, we all knew they

did not necessarily hold better archival content. Those who used our proposed methods then worried that using more visual formats created a format too spare and prone to information collapse unless the speaker was there to vocalize meaning of the visuals. Thus, the third major part of the shift in slide use that we advocate is to incorporate archival documentation notes into slide decks (see Chapter 10).

Feel confident about these techniques

Some of these ideas may already be familiar to some readers. High visuals and the eschewing of bullets have been a popular point of discussion of late. However, we aim to address that segment of presenters who find themselves presenting complex, technical work. The impulse to load slides with as much information as possible is a generous one, for it reflects the desire to share knowledge. We appreciate the goal of sharing complex knowledge, but we invite our readers to experiment with the techniques we offer as a means of achieving it in a new manner.

Most assuredly, addressing the need for slide decks and files to function as archival and legacy pieces will be revelatory for many, but this is the working truth for many organizations and classes. All technical sectors who have put these techniques to work report success, again and again. They alter, change, tinker, and transform the techniques to make them work for specific needs, which is wonderful. These are agile presentation methods, and we hope you find them of great use.

References

- [1] M. Alley, M. Schreiber, E. Diesel, K. Ramsdell, and M. Borrego, "Increased learning and attendance in resources for geology through the combination of sentence-headline slides and active learning measures," *Journal of Geoscience Education*, vol. 55, no. 1, pp. 85–91, January 2007.
- [2] M. Alley, M. Schreiber, K. Ramsdell, and J. Muffo, "How the design of headlines in presentation slides affects audience retention," *Technical Communication*, vol. 53, no. 2, pp. 225–234, May 2006.
- [3] M. Alley and K. A. Neeley, "Rethinking the design of presentation slides: A case for sentence headlines and visual evidence," *Technical Communication*, vol. 52, no. 4, pp. 417–426, November 2005.
- [4] M. Alley, M. Schreiber, and J. Muffo, "Pilot testing of a new design of presentation slides to teach science and engineering," *2005 Frontiers in Education Conference*, Indianapolis, IN: ASEE/IEEE, October 2005, paper 1213.
- [5] M. Alley and H. Robertshaw, "Rethinking the design of presentation slides: The importance of writing sentence headlines," *2004 International Mechanical Engineering Conference and Exposition, Association for the Society of Mechanical Engineering*, Anaheim, CA: November 2004, paper 61827.
- [6] M. Alley, *The Craft of Scientific Presentations*. New York: Springer-Verlag, 2003.
- [7] C. Atkinson, *Beyond Bullet Points: Using Microsoft® PowerPoint® to Create Presentations that Inform, Motivate, and Inspire*, San Francisco, CA: Microsoft Press, 2007, New edition 2011.
- [8] N. Duarte, *Slide:ology: The Art and Science of Creating Great Presentations*. Sebastopol, CA: O'Reilly, 2008.

[9] G. Reynolds, *Presentation Zen: Simple Ideas on Presentation Design and Delivery*. Berkeley, CA: New Riders Press, 2008, *New edition* 2011.

[10] E. R. Tufte, *The Cognitive Style of PowerPoint*. Cheshire, CT: Graphics Press, LLC, May 2003.