

Context for “The Dangers of Using PowerPoint as a Communication Tool” Oral Presentation

Purpose: To make students aware of the dangers of using PowerPoint as a communication tool and to suggest fitting ways to communicate and display visual data.

Audience: Students entering scientific, engineering, and other technical fields.

Materials: Oral script, PowerPoint slides, printed handout, and bibliography. The printed handouts should be distributed to the audience members immediately before the presentation starts. Copies of the bibliography should be placed where audience members can pick them up on their way out following the presentation.

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Oral script information: The blue parenthetical text found within the oral script indicates the presenter’s actions. The green text indicates the presenter’s references to the printed handout figures.

The Dangers of Using PowerPoint as a Communication Tool

...and How Best to Use it if you Must

Oral Script

Lincoln's Gettysburg Address as PowerPoint slides

(Slide #1 is already displayed as the audience is seated and I go to the podium.)

(I display slide #2.)

Fourscore and seven years ago (I pause and call attention to the ridiculous bar chart with my pointer stick.) our fathers brought forth on this continent a new nation, conceived in liberty and dedicated to the proposition that all men are created equal.

(I display slide #3.)

Now we are engaged in a great civil war, testing whether that nation, or any nation so conceived and so dedicated, can long endure. We are met on a great battle-field of that war. We have come to dedicate a portion of that field, as a final resting-place for those who here gave their lives that this nation might live. It is altogether fitting and proper that we should do this.

(I display slide #4.)

But, in a larger sense, we cannot dedicate — we cannot consecrate — we cannot hallow — this ground. The brave men, living and dead, who struggled here, have consecrated it, far above our poor power to add or detract. The world will little note, nor long remember, what we say here, but it can never forget what they did here. It is for us the living, rather, to be dedicated here to the unfinished work which they who fought here have thus far so nobly advanced.

(I display slide #5.)

It is rather for us to be here dedicated to the great task remaining before us — that from these honored dead we take increased devotion to that cause for which they gave the last full measure of devotion — that we here highly resolve that these dead shall not have died in vain — that this nation, under God, shall have a new birth of freedom— and that government of the people, by the people, for the people, shall not perish from the earth.

(I display slide #6.)

Did you blink an eyelid? If you don't recognize this slide presentation as a parody, I have my work cut out for me! (I smile.☺) Peter Norvig, Director of Research at Google, created this PowerPoint presentation in what he called “a dark night of the soul.” He felt that PowerPoint presentations ruled everything around him. He wondered what history would have looked like had we gone back in time and supplied the PowerPoint tool to historic figures such as Abraham Lincoln.

Scary, isn't it? Great oratory reduced to a few bullet points. How about Martin Luther King's *I Have a Dream* speech? Can you imagine it converted to passionless slides?

The ubiquity of PowerPoint

But we're not here to discuss oratory. You're here as future scientists, engineers, and technicians. You deal with communication of technical data. You may be asking, “What does this have to do with me?”

Well... (I pause.). For one thing, if you haven't already encountered PowerPoint—either as a creator or as a recipient of information—I'm sure you will soon. PowerPoint is the most ubiquitous presentation tool in industry, academia, and the military. It's been estimated that it accounts for over 95% of the world's presentation software.

The controversy over its use

For some years now, controversy has ensued about PowerPoint's use. Proponents claim that it makes things easy for the presenter. Opponents claim that it makes things hard for the audience,

and some go so far as to say that the tool makes us dumb. According to a New York Times article, retired Defense Secretary and former Marine General James N. Mattis, was quoted as saying, “PowerPoint makes us stupid.” In that article, military commanders expressed concern that PowerPoint stifles discussion, critical thinking, and thoughtful decision-making. Steve Jobs disapproved of using slide decks within Apple. According to Walter Isaacson’s biography on Steve Jobs, Jobs is quoted as saying “People who know what they’re talking about don’t need PowerPoint.” Jobs preferred to hash things out at meetings with the use of a whiteboard. More currently, Jeff Bezos, founder and CEO of Amazon, won’t allow PowerPoint’s use within Amazon. Instead, Bezos requires that during the first thirty minutes of a staff meeting, people sit and read pages of text.

So what’s wrong with PowerPoint? It’s just a tool after all...isn’t it? Isn’t the problem with the user of the tool, not the tool itself? While I agree that the user of a tool is an important element, I’m here to argue that the tool itself has deficiencies.

Cognitive deficiency

First, there’s a cognitive deficiency inherent in the tool. Consider its name—*PowerPoint*. The name implies “power pitches,” pitches that someone with a sales intent might make. Is this suitable for serious communication of data? In your field, serious communication and integrity is your intent. You aren’t selling. Rather, you are asking your audience to analyze your data and to reason.

Comparative data analysis deficiency

PowerPoint makes comparative data analysis almost impossible. By its very nature, its style is sequential—one slide follows the next. If you have tables and charts with much data on multiple slides, or if you have to divide that data up into multiple slides because of limited space, there is no way for your audience to compare and analyze those tables and charts in their visual field all at once. One slide follows another in time in linear fashion.

Projected image resolution limitations

(I display slide #7.)

Another problem with PowerPoint (or any kind of slideware) is its limitations due to projected image resolution. It's difficult to communicate large volumes of complex data if your audience can't read the details on a slide! You work with a lot of detail in your chosen fields. The limited resolution of a projected image forces you to keep information thin in order for your audience to see it. Granted, the slide I selected to make my point is ridiculous. Retired Gen. Stanley A. McChrystal, a former commander of the International Security Assistance Force in Afghanistan, remarked of this slide: "When we understand that slide, we'll have won the war." (I smile.☺)

Communication by bullet points

Yet another problem is communication by bullet points. PowerPoint does not lend itself to complex thought and full sentences. Limited space means you have to resort to lists of bullet points, or as some detractors refer to them, "bullet point grunts."

Deep hierarchical bullet point dangers

Related to bullet point communication is the problem of deep bullet point hierarchy. PowerPoint allows for bullet point indentation six layers in. A little later on, I will give you an example of how dangerous it can be to bury information that deep on a slide.

Obfuscation of data by "chartjunk"

(I display slide #8.)

There's also the problem of obfuscation of data. Let me explain. The table you're looking at is a 2002 cancer survival chart from the Lancet, a medical journal. There's nothing wrong with this table. It displays its data simply, and it's easy to comprehend. Now look at the next slide.

(I display slide #9.)

You can better see the detail from this slide in figure 1 of your printed handout. These charts were derived from the data in the table I just showed you. DARPA's short-lived Information Awareness Office from 2002 divided the data into six slides and "decorated" them. This is a prime example of what *not* to do. The data contained in these charts is nearly incomprehensible due to unnecessary graphic elements obscuring the data. Note, for example, the 3D features that do nothing to aid comprehension, but only add confusion.

(I display slide #10.)

Now take a look at figure 2 to the right of figure 1 in your printed handout. The data presented in figure 2 is identical to that in the original table and to that in DARPA's tables. A couple of improvements have been made over the original table, one by listing the survival rates in order, and the other by adding visual lines to represent the relative drops in rates over the five-year periods.

Compare figure 1 and figure 2. Figure 1 exemplifies a danger that many PowerPoint users fall prey to. They obfuscate content by using "chartjunk," a term that was coined a few years ago to refer to the gratuitous graphic features available in PowerPoint. PowerPoint provides so many texture fills, gradient fills, and 3D special effects that it's like being in a candy store. Avoid the temptation! As you can see by this example, it's extremely difficult to comprehend the data in figure 1.

Take a closer look at the figure 2 chart. Note how minimal it is, how devoid of gratuitous graphics. Edward Tufte, a Yale professor who the New York Times once referred to as "the Leonardo da Vinci of data," came up with a term for this phenomenon. He refers to it as the "data-ink" ratio, i.e., $\text{data} \div \text{ink}$. The higher the ratio, the more comprehensible the chart should be. In other words, the less ink (these days, "digital ink") used to display the data, the better. I quote Tufte: "Above all else, show the data."

(I display slide #11.)

Here's another image to illustrate what I mean by data-ink ratio. Refer to figure 3 in your handout. The image to the right is what you want to strive for. Eliminate all extraneous elements—"ink" if you will—that distract from the core message.

Oversimplification of content

(I display slide #12.)

PowerPoint forces one to oversimplify in order to live within its spatial limitations. It forces one to keep data density low. (I look towards the projected slide image.) Here are some recommendations from the Harvard School of Public Health's Instructional Computing Facility. (Do the slide images start to approach a first grade reading primer?) Do you think these rules might impinge upon your serious data communication?

Historical consequences of PowerPoint's misuse

(I display slide #13.)

While much of the world simply accepts PowerPoint as an established form of communication, the software is reviled among some. Edward Tufte is one of the leading opponents of PowerPoint. Tufte served on the investigative board after the Columbia space shuttle accident of 2003. In that accident, a piece of foam debris hit the left wing of the shuttle shortly after launch. Scientists and engineers at NASA and Boeing then spent the next several days trying to assess the damage to the tile on the wing. Upon atmospheric entry twelve days later, Columbia disintegrated, killing all seven crew members.

(I display slide #14 and a little later slide #15.)

(I glance at the projected image.) This slide and the one following are from Boeing's communication to NASA. Please refer to figures 4 and 5 in your printed handout. After it was discovered that a problem existed, Boeing engineers attempted to analyze the situation. They communicated to NASA—not with technical reports—but with PowerPoint slides. The slide markup you see represents Edward Tufte's critique of one of Boeing's slides upon the board's investigation following the accident.

Note the bullet point communication and the deep bullet point hierarchy. Whereas the slide's large title suggests optimism, the deeply buried bullet points farther down reveal Engineering's misgivings about the situation. Five and six bullet point level indentations are problematic.

Another troublesome thing is the spatial limitation of a slide. Communication as critical as this needs to be expressed as full sentences, not truncated bullet points made to fit the slide area.

One of several conclusions of the investigative board was that NASA and Boeing relied too heavily on PowerPoint for communication. The board reported: “At many points during its investigation, the Board was surprised to receive similar presentation slides [similar to the Boeing slide with all its problems] from NASA officials in place of technical reports. The Board views the epidemic use of PowerPoint briefing slides instead of technical papers as an illustration of the problematic methods of technical communication at NASA.”

Occasions in which PowerPoint is acceptable

Are there occasions in which PowerPoint communication is acceptable? I would venture yes, for extremely simple communication—for example, an instructor giving assignment instructions. For situations such as those you will frequently find yourself in, where data, integrity, and complex reasoning are at stake, use alternatives as much as possible. Few methods stack up to high resolution print for audience analysis. Serious communication should warrant technical report type communication.

Smart and practical ways to use PowerPoint selectively

If you have an occasion to make a presentation, concentrate on your speech. Do not use PowerPoint as a crutch to carry your presentation, and never read slides aloud. Use PowerPoint selectively. There’s nothing wrong with using it for image projection purposes. Do not fill slides with your content. Rather, let a few selective images support your content. Express your thoughts in sentences and narratives. Create printed reports and handouts for your audience. Create graphics (preferably with Adobe design software if you are skilled at it) and large, complex data charts and tables. Your audience will gain much more from detailed, printed material than they will from slides delivered in linear fashion.

Concerning your charts and tables, remember to strive for a high data-ink ratio. Eliminate gratuitous graphics, special effects, and all manners of chartjunk. (I might also suggest minimizing your use of clip art and stock photos which are rampant in corporate presentations.)

Chartjunk distracts and cheapens your message. Think complex thoughts, and display your data with integrity. Also, don't lie with your graphics as some do, for example, with inaccurate scaling.

A few alternative presentation software programs exist, but the differences may not be substantial insofar as our principles go. Moving, interactive graphics might be something to consider in the future as technology evolves. Check out the work of the late Hans Rosling, listed in my bibliography. In the meantime, use PowerPoint as a *supplemental* tool for a presentation, not as the presentation itself. PowerPoint can be used effectively if you limit its use to projecting a few selective images.

Summary

(I display slide #16.)

I urge you to read Edward Tufte's works for insight and inspiration on the visual display of information. Feel free to pick up a copy of my bibliography in which I list his works. Strive to practice the principles we've covered. Remember that content is most important. Communicate with clarity—both in your writing and in your information displays. When the occasion calls for it, communicate with technical papers rather than slide shows. Be conscious of the way you display data. In the case of a presentation, use narratives—not bullet points.

I'll close with a quote from George Orwell that Tufte places in his Cognitive Style of PowerPoint chapter within his book *Beautiful Evidence*. In his essay *Politics and the English Language*, Orwell says, "The English language...becomes ugly and inaccurate because our thoughts are foolish, but the slovenliness of our language makes it easier to have foolish thoughts."