



Oral and Written Communications

- One of the most important skills that the technologist must possess is that of communication.
- Your instructor has seen careers damaged because an engineer or software expert could not present a good oral presentation or write a coherent report.
- **Make no mistake: Much of your career will be spent communicating orally or in written form:**
 - To your superiors
 - To your peers
 - To your subordinates (later in your career)
- Learn to communicate effectively!

How to Master Communication?

- The very essence of technology development is communication.
- If you develop a new technology, what good does your accomplishment do if you have no way to communicate the new technological development and incorporate it into products and services? Communication is vital.
- How does one develop the ability for effective communication?
- Just like everything else, it requires training, honing of skills, and preparation.

Preparation

- **As a technologist, you will almost always be giving an oral or written report in one of just a few areas:**
 - **A proposal (generally seeking funding).**
 - **A project status report (usually with the object of continuing project funding).**
 - **An end-of-project report.**
 - **(Occasionally) A report on a scientific discovery.**





Preparation (2)

- **Note that the preceding report definitions have a common theme:**
 - **Generally related to money in some way.**
 - **The \$\$\$ factor is usually project funding or company profit!**
- **In general, the method to proceed on any report is:**
 - **Decide on the theme or main idea for the report.**
 - **Gather data to support your findings.**
 - **Organize the report (by making up some sort of outline in general) so that it will focus on the story you want to tell.**
 - **Write the report or prepare the oral presentation per outline.**



Preparation (3)

- **Most communications need to convey “the seven:”**
 - **Who – will do, is doing, or has done work.**
 - **What – will be, is, or has been done.**
 - **Where – location of work (unless obvious, like engr. lab).**
 - **When – Time frame.**
 - **Why – What is unique about the opportunity.**
 - **How – Scope, approach, etc.**
 - **Impact – Reason we have got to do (or continue) this!**
- **Emphasis depends on state of work.**
 - **If proposed: Why, how, impact.**
 - **If in work: Who, what, when.**
 - **If complete: How, who, impact.**



Research

- **Generally, your technical research will be the supporting data for your report.**
- **Occasionally (for example, in proposals), you may need to research technology sources in order to support your funding request, such as:**
 - **Technical journals**
 - **Technical textbooks**
 - **Conference proceedings**
 - **Government or university reports**
 - **Patent disclosures**
 - **(Possibly) the internet**



Research on the Internet

- **BEWARE THE INTERNET!**
- **There are good articles (even in Wikipedia) but:**
 - **Much content is suspect**
 - **Content often ephemeral**
 - **Often lacking in detail and inaccurate**
- **In general, restrict internet research to:**
 - **University research site of known repute**
 - **Government site**
 - **Other source whose repute you can verify**
- **Best sources are usually reputable technical journals, citations in other reports, library catalogs.**

Report/Presentation Organization

- **Good organization of a report or presentation is key.**
 - You are usually trying to “sell” a point of view.
 - To do this, you must clearly get your ideas across.
- **Consider the old saw: “Tell ‘em what you’re going to tell’ em; tell ‘em; tell ‘em what you told ‘em.” I.e.:**
 - **Introduce topic with the key points,**
 - **Do body of presentation emphasizing those points, and**
 - **Summarize the key points at your close.**
- **There are any number of “strategies” for constructing a report or presentation. I prefer the “old fashioned” method of straightforward exposition.**

Report Writing

- **Writing:** A report must be accurate, concise, as brief as makes sense, and clear and easy to understand.
- Such writing takes organization, planning, and knowledge of your subject.
 - **Organization** – You will be writing office communications such as email or memoranda, proposals to secure funding, and reports (project reports or papers submitted to technical publications). The type of organization depends on the report.
 - **Report structure** – Use an organization that is clear and easy to comprehend, such as major sections and subsections as necessary. Topic sentences are a good way to start a new section or paragraph.

Report Writing (2)

- Always organize reports (written and oral) around “the seven:” **Who, What, Where, When, Why, How, Impact.**
- A good report format:
 - Introduction. **“Tell ‘em what you are going to tell ‘em”**
 - Work or project overview, including goal/impact.
 - Key tasks, personnel assignments, locations.
 - Overall schedule or timing chart, with key milestones.
 - Budget showing principle (large) expenditures.
 - Progress to-date (if appropriate).
 - Summary/project status (if appropriate). **“Tell ‘em what you told ‘em.”**
 - Forecast for next time period (prior to next report, if appropriate).

“Tell ‘em”



Report Writing (3)

- **Reconciling the “seven” and the report format:**
 - Introduction. **What, Why, Impact**
 - Work or project overview, including goal/impact. **What**
 - Key tasks, personnel assignments, locations. **Who, Where**
 - Overall schedule or timing chart, with key milestones. **When**
 - Budget showing principle (large) expenditures. **How**
 - Progress to-date (if appropriate). **How**
 - Summary/project status (if appropriate). **How, Impact**
 - Forecast for next time period (prior to next report, if appropriate). **How, Who**
- **Notice that report format covers the “seven.”**

Becoming an Accomplished Writer

- Good writing requires **training and practice**. A document usually takes several passes, including review and editing.
- **English = polyglot of grammatical rules**. It requires experience to know when a written passage “sounds right” or whether it needs more work.
- **English has two base or parent languages – Latin and northern European; it has rules and words of both**.
- **Note: Unless you are new to English, you should have learned these rules in grade 1-12 schooling so just keep them in mind.**





Other “Rules”

- **In addition to grammar rules, there are also “rules of good writing.” A few of these below:**
 - **Avoid sentence fragments (except occasionally for emphasis).**
 - **Avoid overly long or short sentences (shortness can amplify).**
 - **Use active voice, which requires fewer words. “Technical writing third person passive” (“such-and-such was done,” “a measurement was taken,” etc.) is now passé.**
 - **Be precise. As a technologist, you deal in facts, not feelings!**
 - **Reduce prepositions in favor of adjectives.**
 - **Eliminate redundancies. The fewer words, the better. I have constant problems with this!**
 - **Do not use bureaucratic terms!**
 - **Avoid informal language, e.g., “The equipment was busted.”**



“Rules” (2)

- Avoid pompous language, that is, “fifty-cent words.”
- Avoid sexist language. Many modern authors use “she” as the third person pronoun to avoid any indication of sexual bias.
- Avoid dangling modifiers or phrases. (Churchill anecdote!)
- Avoid split infinitives (something you should have learned when about 12 years old).
- Use hyphens for clarity, esp. an adjective phrase (“foot-loose,” “one-hour”).
- Colons introduce a list or an equation. The force equation: $F=ma$.
- Remember to use parentheses set off a list, clarification, or aside. “CMOS logic is used for low-power circuits (but bipolar transistors are still used for high-current applications).”

Miscellaneous

- **Beware word demons! I.e., words that sound alike or are spelled alike. E.g.: to, too, two; through, threw.**
- **Put equations on a separate line, unless fairly simple. Algebraic symbols are usually *italicized*.**
- **Use numbers in text except integers of 10 or less with no units, ordinals below 10, common fractions, etc. Never start a sentence with a number.**
- **Nothing makes you sound worse than sentences without subject/verb agreement. Ex: One of the seven invitees were late. One is the subject, not invitees, so the correct sentence is: One of the seven invitees was late.**

Miscellaneous (2)

- **Verb tense – Use the past tense in technical writing.**
- ***Italics*** are used for foreign words, scientific names of organisms, defined words, books and journal names.
- **Articles – The is used for a specific noun. Article adjectives in English take practice, especially for those who native language is pictographic (Chinese/Japanese).**
- **Figures and tables – Should be referenced in the text and appear just after the reference.**
- **Lists – Start with simpler items, go to the more complex, preceded by a colon.**

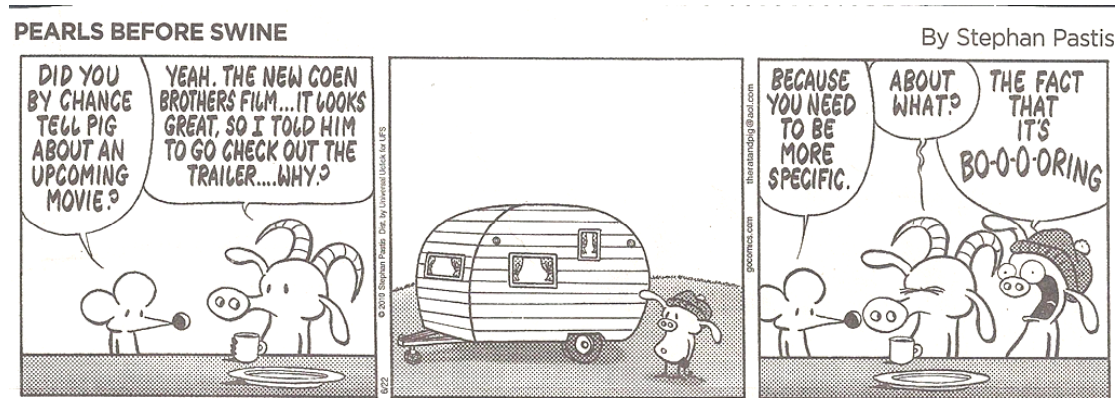


Miscellaneous (3)

- **Spelling – Use spell-check! Do you want to sound like a moron? This is your second reminder.**
- **Proof-read carefully! Spell check will not catch a correct word, used improperly. E.g., in a presentation of mine, it missed “Proper grammar us very important.”**
- **References – Be aware that magazine and book publishers have specific citation requirements for submissions.**
- **Remember that there are inconsistencies in English grammar. Sometimes, you just have to choose what seems appropriate and then be consistent!**

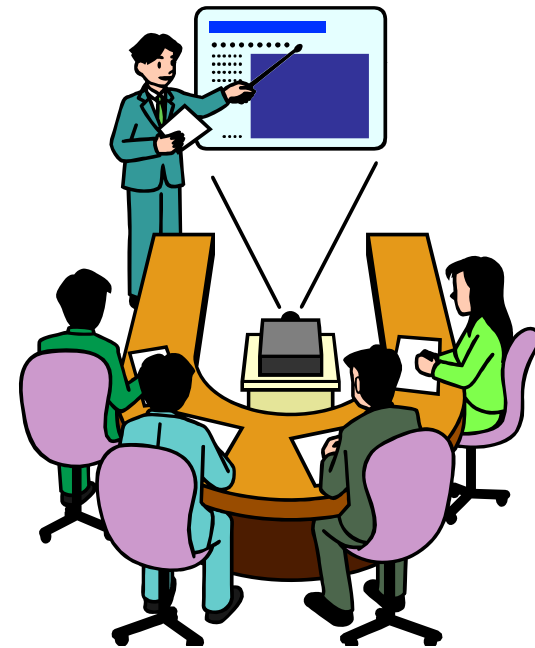
Miscellaneous (4)

- Finally, be careful to assure that words used colloquially in various ways are used in your writing only when the meaning is very clear!



Oral Presentations

- In the company environment, most oral presentations are to your:
 - **Engineering team**
 - **Your boss or his boss**
 - **Or so on up the ladder; as an engineer, I have presented to the CEO**
- Main point in oral presentation: **Sell both the project and yourself.**
- Some authorities suggest telling a joke, to get started. In the instructor's experience, this is a really bad idea. **(True Story)**





Oral Presentations (2)

- **Other authorities suggest treating the presentation like a motivational speech. But: Bosses just want the facts! Your only motivation should be the material and your method of presenting it expertly!**
- **How to start:**
 - **Introduce yourself and start the presentation.**
 - **Don't use a title slide, just your first information slide.**
 - **A good initial slide asks a question or makes some statement about profit or business opportunities.**
 - **Be prepared to back any claims up!**
 - **In general, PowerPoint™ slides are better than some sort of slides based on a text file or Microsoft Word™.**

Presentation Content

- **Most oral presentations should still concentrate on “the seven.”**
- **Work through these in an organized manner that makes sense to listeners.**
- **When changing subjects, a title at the top of a slide is helpful.**
- **Emphasize major points and try to have a positive conclusion, e.g.:**
 - **Project is on schedule.**
 - **5% over budget due to front-loading of parts orders.**
 - **Still anticipate coming in on the dollar.**
 - **No major technical issues.**
 - **Current product forecast is on schedule.**



“Hooking” the Audience

- **Know your audience.**
 - What are they looking for?
 - What represents a “good result” here?
 - What outcome do **you** want?
 - May need to alter, exclude, or add to “the seven.”
- **What aspect of your project piques the curiosity of the listener?**
 - **Example: Picture of a smart mobile phone, with caption: “Scared of the hassle in converting to a smart phone? We’ll make it easy for you.”**



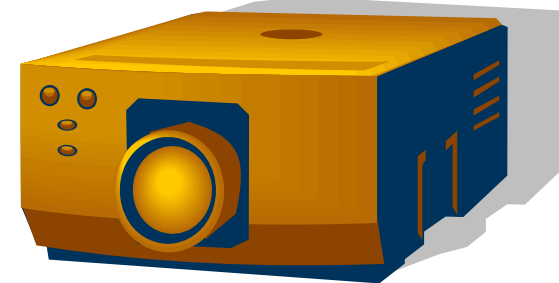
Visual Aids

- Visual aids are **very important**.
- A strong oral presentation + good visual aids = **higher retention rate by the audience**.
 - Tables are okay, but graphs are better!
 - Charts and graphs show mathematical data well (e.g., pie charts to show market share).
 - Pictures and photographs (even videos) have real impact.
 - A prop is good. “Show and tell” isn’t just for 3rd grade!



Presentation Tools

- Older-style presentation tools such as 35 mm slides and transparency projectors, or even large drawing pads, are still used.
- For me, the “go-to” presentation tool is Microsoft PowerPoint. Get familiar with it and learn to use it!
- Your instructor has literally given thousands of presentations and a LOT of them were in PowerPoint!
- The flexibility of the computer-based presentation makes it today’s choice.



PowerPoint Presentations

- **Select a pleasant background (or “slide master,” in PP jargon).**
- **Use colors with care, but use colors!**
- **PP graphics are easy to conjure up, so use them.**
- **Not too many points on a slide – use the KISS (Keep it simple, stupid!) principle. In this lecture, I sometimes violate my own principle!**
- **Choose font carefully. I like Times New Roman.**





PowerPoint Presentations (2)

- **Limit capitals, but you can use them FOR EMPHASIS!**
- **Check spelling and grammar. Nothing makes you look like a bigger loser that bad grammar and spelling. (This is your third notice!)**
- **Limit PP special effects, such as swooshes, fade-ins, etc.**
- **(Important!) If you have special symbols and typefaces on your computer, they may not be on the presentation computer, which may garble your information. A good reason to use your own laptop for a presentation!**

Presentation Principles

- **Don't READ your slides!**
- **“Cryptic bullet points.”**
- **Avoid jargon – unless the audience is really all in your field. Then a little (emphasis on little) jargon may help to heighten your credibility.**
- **Know the audience tech level! Former TI CEO Mark Shepherd on addressing board or upper management: “Ned in the third grade.”**





Presentation Principles (2)

- **Always have a backup. You don't want to be crippled by the loss of your media!**
- **Although there are other media than computer-based display presentations, don't worry about them. I haven't made a slide or non-computer presentation in nearly 30 years!**
- **Handouts can make sense, if some of the information is particularly complex or lengthy.**
- **In general, use horizontal ("landscape") slides.**

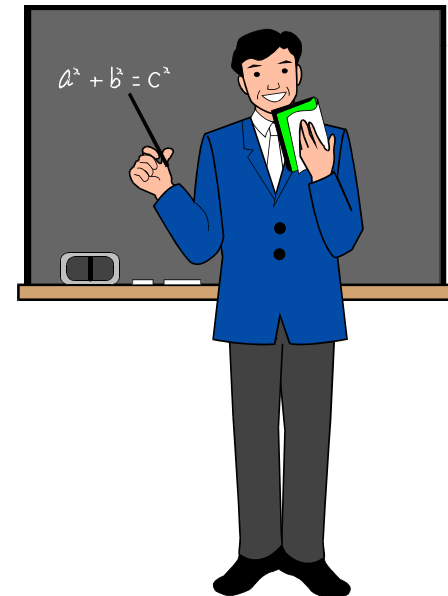
Speech Anxiety

- Tricks to avoid speech “panic:”
 - Be well prepared – quickest way to gain respect. (True story: female colleague presentation to a hostile audience)
 - “Hit ‘em hard” (get their attention).
 - Old saw: “Visualize audience as naked.”
Better: Visualize them as friends! It’s hard to be afraid of friends.
 - If you make a mistake, forget it and move on. Hang loose!
 - Allow yourself to relax. Tenseness causes adrenalin to flow and increases anxiety (and voice pitch!). Hang loose!



Style

- **Communication = verbal + body language + vocal strain.**
 - **Eye contact = direct connection (“sincere”).**
 - **Scan the audience; look them ALL in the eye!**
 - **Speak from your diaphragm. “Project.”**
 - **Don’t block the screen or other media.**
 - **Avoid distracting mannerisms (hands in pockets, “uhs,” staring out into space).**
 - **Don’t be stiff; keep it somewhat informal.**
 - **Dress well (“appropriately”).**
 - **Be enthusiastic (a comment on many of my student reviews!).**



The “Elevator Speech”

- **So, here’s the deal:**
 - You board the elevator at work and there is your boss by herself (or her boss or the CEO).
 - She says, “How are things going?”
 - You (or you and your team) have a great new idea that will make a \$billion-dollar product and you need immediate funding.
 - What do you do?
- **The “elevator speech” is the solution!**
 - Informal talk, ~ 1 minute (or less!).
 - Organization is crucial.
 - Cover key points in brief.
 - **Hard hitting, attention-getting!**



“Elevator Speech” (2)

- Remember “the seven?” Here, emphasis on “the four:”
 - **WHO** (who are you why are you important?).
 - **WHAT** (What are you talking about or what do you do?).
 - **WHY** (What is unique about what you are doing), and
 - **IMPACT** (What you plan to accomplish or are currently working on accomplishing).
- Sometimes topics (above) can vary, but remember:
 - **Gotta be brief! She gets off the elevator soon!**
 - **Gotta get her attention! If she’s bored, you’re toast!**
 - **Gotta sell! If the why and impact miss, the speech is wasted!**
- Harvard Business School thinks the “elevator speech” is so important, they have a website about it:
<http://www.alumni.hbs.edu/careers/pitch/>

Summary

- **Fluent communication can enhance your career; inept communication can sink it.**
- **In presentations, focus on the audience, connect, and show your enthusiasm. Be prepared; know what your audience expects and their “hot buttons.”**
- **In writing, be accurate, clear, concise, and jargon- or technical-slang-free. Practice to improve your grammar and ability to express yourself.**
- **Your communications are a way of promoting yourself and selling your abilities and technical acumen.**
- **Remember “the seven!”**

