Technical Presentation Methodology

Learning from our Errors

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Good oral communication skills are considered to be a necessary achievement of a college graduate, according to accreditation requirements. To help students achieve these types of skills, a series of lectures were given, over the last two years, to over 200 students in both upper division engineering technology courses and a Freshman Engineering Design (FED) course. These lectures were designed to provide students with information on presentation techniques, and contained topics such as planning a presentation, building the presentation, overcoming fear, and how to make a presentation more interesting.

The material is based on both the author's prior industrial presentation experiences as a marketing executive in various technical companies, as well as observations on errors in presentation methodology that students made in class over the last five years. This paper will review the material presented to these students. While references are made to PowerPoint, this paper is intended to enhance the presentation skills of the students as oppose to their knowledge of a specific computer application. Many of the concepts in this paper can be used with presentations involving overheads. An evaluation sheet that can be used to reinforce the concepts of this paper is also included.

Oral and written communication skills are important for students graduating into today's industrial climate, as well as helping institutions meet accreditation requirements. In a recent advertisement for a development engineer, a major medical instrumentation company listed three qualifications: the first was a BSEE or equivalent, the second was low signal and low-noise analog development experience, and the third qualification was written and verbal communication skills. Companies believe that those with superior communication skills, rather than technological skills, will be the companies on the cutting edge.

With today's computer technology, communication to groups of people can be best accomplished using presentation software packages, such as Microsoft PowerPoint®. Effective use of this type of package requires more than just an understanding of how to use the software. What is also needed is an understanding of basic concepts of presentation techniques. These skills are independent of the type of application used, although use of standard word processing applications usually results in poor presentations.
Presentation Techniques

- Anxiety
- Clipart
- Bullets
- Technical Drawings
- Practice
- Speaking
- Numbering pages
- Ending
- Beginning of presentation
- Other topics
- Still other topics
- Can’t stop now
- Running out of space
Another Slide Example

• This is the first bad slide, because it uses all sentences that are greater than one word, and tries to convey the meaning of an entire sentence or paragraph into a few bullets, rather than break the sentences up into bullets and sub-bullets.

• If you don’t break up the main bullets into sub-bullets, they can overpower you, and it would be very difficult to read these bullets. Because they are difficult, you might not follow the lecturer.
Concept of Talk

• Deals with how to present (How to apply the tool)
  – Not how to use PowerPoint features (How to use the tool)
    • Though will see some aspects of PowerPoint
  – Won’t show you how to create a presentation
    • How to plan and deliver it
Information Sources

• Prior experiences by presenter
  – Over 20 years industrial experience
    • 7 years in R&D and product development
    • 13 years in marketing and sales
  – Presentation experiences
    • Customers, sales training seminars
    • Board of director’s meetings
    • Technical papers & classes
• Review of mistakes - student and others
Agenda

Planning

Reducing anxiety

Creating a presentation

Practice

Dealing with Technical Slides

Enhancing a Presentation

Delivery of Presentation

End
You can ask questions during this talk
Let’s Get Started
Joseph Priestly (18th Century Chemist, Theorist and Clergyman)

Discovered Oxygen

“The more elaborate our means of communication, the less we communicate”

He obviously didn’t know about PowerPoint
Communication Skills are needed in technical job area

Oral

Written

Success
Three Requirements

• BSEE or equivalent

• Low signal and low-noise analog development experience

• Written and verbal communication skills
Planning

Reducing anxiety

Creating a presentation

Enhancing a Presentation

Dealing with Technical Slides

Practice

Delivery of Presentation

End
4 Questions to Ask

- **Who** is the audience?
- **What** are the goals of the audience?
- **What** is going to be presented?
- **How** is the presentation going to be given?
Who is the Audience?

• Understand technical abilities
  – Don’t get too technical for general audience
  – Don’t use acronyms or specialized words for non-technical audience
    • Firewire, GPS, IEEE 488
    • Use examples and stories
  – Don’t be too simple for technical audience
    • Still explain acronym first time
What are the Audience’s Goals?

- What type of information do they want?
  - Understanding of general topic
  - New concepts
  - How to do something

What do you think they want to take away from the talk?
What is to be Presented?

- Design for Top-Down Approach
  - Start with main concepts
  - Fill in as needed
  - Use Outline View

3. Communication Skills are needed in technical job area
4. Recent Job Description
   GE Medical
   - BSEE or equivalent
   - Low signal and low-noise analog development experience
   - Written and verbal communication skills
5. Agenda
   - Cover 20 key points in presentation
     - From title page through ending
     - Key topics include:
       » Style
       » Reducing anxiety
       » Using voice and body effectively
       » Styling of slides
   - Present to students in various lab courses
6. Presenter’s Background
   - Over 20 years industrial experience
     - 7 years in R&D and product development
     - 13 years in marketing and sales
   - Presentation experiences
Other Design Approach

- **Bottom-Up**
  - Randomly put in slides
  - Brainstorming
  - Use Slide Sorter view to rearrange
Presentation and Report
How is the presentation given?

• Background problems
  – Reduce brightness (30%)
    • Have backup

• Overhead
  – B/W slides most of the time
    • Need to view how PowerPoint looks
Overheads vs. Slide Show

• Advantages of overheads
  – Immune to computer glitches
    • Not to bulb burnout
  – Doesn’t appear “glitzy”
    • So what

• Advantages of slide show
  – Control appearance of bullets easier
  – Multimedia/Internet connectivity
  – Use of colors much more \textcolor{red}{dramatic}
  – Change on the fly
Plan on how to cover questions

- **During or at end**
  - During involves audience
  - End is easier
    - Time restriction
- Presenter can still ask questions
  - Prefer at end
Reduce Anxiety - Part 1

- Know material - practice 5 to 6 times
  - With each practice gain confidence
    - Don’t memorize
- What are problem slides
  - Pauses or errors
    - Add bullets or extra slides
    - Key words to trigger you
- Don’t use cards

- Visualize successful presentation
Reduce Anxiety - Part 2

- Start: Stand erect, deep breath, smile, eye contact
  - Upbeat voice
- Rapport - yes/no or showing of hands
  - Get audience involvement
- Be yourself - tell story
- Experience
  - First time vs. 20th time
Creating a presentation

- Planning
- Reducing anxiety
- Enhancing a Presentation
- Dealing with Technical Slides
- Practice
- Delivery of Presentation
- End
Structuring the Opening

• Title slide first
  – Speaker’s name, class, subject
    • Nice large font, WordArt, or other application

• Either agenda or introductory slide follow
  – Agenda slide lists main points
    • Expand slide
  – Introductory slide
    • Opening remark
    • Quote

Establish relevancy of topic to audience
Bulleted Slide Structure

• Keep to 5-6 main bullets
  – Break up into multi-slides if more
  – Less bullets if use a lot of sub-bullets

• Keep to one sentence if possible
  – Use sub-bullets to add additional text
    • Will prevent you from reading screen

• “Joy of Six”
  – Max six points per slide, six words per point
Think of all these points

- List all the tasks
- Create time frames for all tasks
- Arrange in groups
- Link all the tasks
- Create milestones
- Develop resources and their costs
- Assign resources
- Resolve conflicts
- Look at alternative linking
- Manage the program
- Report to management

Keep to 5-6 main bullets

Can use more once in a while
Too Many Words on Slide

Would like to present the following points on the development process. The five phases of a development process include the product definition, design, test and evaluation, production and support phases.

Typically, we would spend a lot of time in test and evaluation phase, where we should be spending more time up front in the product definition and design phase.

In the product definition phase marketing typically will outline a series of specifications that hopefully are derived from quality marketing research with targeted customers. In that phase, technical feasibility must also be considered.

In the design phase, prototype development occurs. In recent years the concept of concurrent engineering has encourage multi-disciplinary meetings between engineering, marketing, production, service, and .....
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Development Process

Would like to present the following points on the development process.
The five phases of a development process include the product definition, design, test and evaluation, production and support phases.

Typically, we would spend a lot of time in test and evaluation phase, where we should be spending more time up front in the product definition and design phase.

Look at first 2 paragraphs

• Five Phases
  – Product Definition
  – Design
  – Want more time spent
  – Test and Evaluation
  – Production
  – Support
Would like to present the following points on the development process. The five phases of a development process include the product definition, design, test and evaluation, production and support phases.

- **Five Phases**
  - **Product Definition**
    - Want more time spent
  - **Design**
    - Want more time spent
  - **Test and Evaluation**
    - Most time typically
  - **Production**
  - **Support**

Typically, we would spend a lot of time in test and evaluation phase, where we should be spending more time up front in the product definition and design phase.
Another Bad Slide - Long Sentences

• This is the first bad slide, because it uses all sentences that are greater than one word
• If you don’t break up the main bullets into sub-bullets, they can overpower you
• Writing these long sentences mean you can’t think of just the phrases
• Even though I might have only five bullets on this slide, it looks too busy
• Would you want someone to look at this slide from a distance
Better Way - Sub-bullets

• This is the first bad slide
  – Uses all sentences that are greater than one word
• Break up the main bullets into sub-bullets
  – Otherwise they can overpower you
• Only write long sentences
  – Can’t think of short phrases
• Have only five bullets
  – Looks too busy
• Look at this slide
  – Looks better from distance
When Using Quotes...

- Avoid bullets
- Can have 2-3 lines

Which looks better?

“The more elaborate our means of communication, the less we communicate”

OR

- The more elaborate means of communication
  - Less we communicate
Determine correct time for slide

• Minimum of 20 seconds, maximum of 2 minutes
  – Avoid movie effect or sleeper effect
    • Add or combine slides if different
    – 20 minute presentation have between 15-30 slides

• Use rehearse time feature
  – Turn off automatic time
Rehearse Time Feature
Starting a New Slide

- New topic means new slide
  - Want to reinforce spoken word with visuals (Demo)
- Remember, people learn in a presentation

By seeing
By hearing
By writing
Numbering Slides

• Important for overheads
  – Problem if dropped or not sorted properly
  – Usually in footer

• Don’t number title slide
  – Option in PowerPoint
Enhancing a Presentation
Vary the slide style and look

- Mix up styles of slides
  - Use graphs, clipart, org charts, two column text
  - Use different text style or bullet styles for emphasis
    - Don’t get carried away with too many styles
    - Sometimes, don’t use bullets
  - Use sufficient size font for the room you are in

Remember, substance over style

But style counts
Fonts

• Different type
  – Serif (Times Roman, Garamond)
    • Better for writing
  – Sans-Serif (Arial, Tahoma)
    • Better for display
    – Still use Times Roman
  – Headline (Braggadocio, Swiss 721)
    • Either media

• Within same font
  – size **size**
  – **Bold**, *Italicize*, Shadow
  – Space between letters **S I Z E**
  – **Color**
    • Be careful
Font Size

• Use different font sizes for sub-bullets
  – From 3-4 points smaller than the main bullet

• In this presentation main bullets are 28 points
  – Sub-bullets (second level) are 24 points and blue
    • Third level is 20 points
  – 72 points = 1 inch
Templates

• Applies color, font style and size, and color background
  – Applies to all slides
  – Can change at any time
  – Be careful about changing too far into presentation
    • Word spacing
  – Can modify all with Master View

• Some templates are not as easy to view as others
  – Background color and font size
  – Can modify specific slides with background/fonts
Same Slide with different Template

• Applies color, font style and size, and color background
  - Can change at any time
  - Be careful about changing too far into presentation

• Some templates are not as easy to view as others
TITLE MOST PEOPLE LIKE

Title Most People Should Use

Use Case Sensitive for Titles

• PUT THE MAIN BULLET IN CAPS
• Put the main bullet in Caps
• Don’t use too small a bullet (24 point)
  – This is smaller (16 point)
  – This is great for reading (11 point)
Graphs - for enhancing data

- The Eastern area has achieved significant growth over the year

- The Western area is not contributing enough in the 3rd Quarter
Graph Hints

• Use Excel for most graphing
  – Can create graph in PowerPoint (difficult)
  – Have more choices in Excel
• Paste or Paste Link from Excel
• Can do same thing with other graphing apps
  – Sigma Plot, Axum
Organizational layout
(wrong way)

• J. Smith is President
• Reporting to J. Smith is
  – K. Kendall (VP Engineering)
  – J. Joseph (VP Mfg.)
  – M. Margolin (VP Sales)
• Reporting to M. Margolin
  – G. Gerardi (Midwest Sales Manager)
  – S. Samson (Eastern Sales Manager)
Org Charts
(Better than words)

ABC Organization- Top Level

Even better is using Visio and copying/pasting
Bullet Styles

✅ Bullets can be different

📚 Be careful not to get carried away

😊 Bullets can be fun

😢 Bullets can be sad

Relate bullet shape to words
Can have two columns of bullets

**Advantages**
- Lower price
- Better warranty
- 800 number for service
- 5 years in business

**Disadvantages**
- Perceived as lower quality
- No in-house service
- Parts hard to find
Using Clip Art

• Need to understand what Clip Art you have
  – Can be humorous
    • Be careful about being offensive
      – Can be used to illustrate a point
  • Either place Clip Art while creating or go back
  • Additional Clip Art from CD’s or Internet
• The visuals should support and supplement your presentation
Frustration with Computers

- People need to take time to understand computer programs
  - Should not get frustrated
  - Occasionally you will

- Remember the cost of a broken computer
Frustration with Computers

• People need to take time to understand computer programs
  – Should not get frustrated
  – Occasionally you will

• Remember the cost of a broken computer
Growth of Women in Engineering

- There has been significant growth over the last 10 years
Other Clip Art from PowerPoint

Stability of Systems

On target with the answer

Need to investigate

Sometimes, just guess
ClipArt/Photos from the Internet

- Go to my home page
  http://www-ec.njit.edu/~rockland/
  - Go to the Links subpage
    - Have a number of links to pictures and clipArt on the Internet
      - AltaVista Photofinder, Scour.Net
    - When get to clipArt you like, right click mouse button
      - Click on Save Image As
  - Be careful about copyright infringement
<table>
<thead>
<tr>
<th>Website</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><a href="http://www.altavista.com/cgi-bin/query?pg=q&amp;stype=simage">http://www.altavista.com/cgi-bin/query?pg=q&amp;stype=simage</a></td>
<td>Alta Vista, which is a search engine, has an excellent image search capability, and is very quick</td>
</tr>
<tr>
<td><a href="http://www.scour.com/">http://www.scour.com/</a></td>
<td>Scour Inc. is a multimedia search engine.</td>
</tr>
<tr>
<td><a href="http://www.webshots.com/">http://www.webshots.com/</a></td>
<td>Webshot is an image search engine that is part of the Excite search group</td>
</tr>
<tr>
<td><a href="http://www.clipartguide.com/">http://www.clipartguide.com/</a></td>
<td>The Whole Internet Clipart Guide is a source of links to other sites that contain clip art</td>
</tr>
<tr>
<td><a href="http://desktoppublishing.com/cliplist.html">http://desktoppublishing.com/cliplist.html</a></td>
<td>A site called Image Paradise provides images for non-commercial use as well as extensive links to other sites</td>
</tr>
</tbody>
</table>
Final Words on Clip Art

- PowerPoint 2000 not complete
  - Better clip art with PowerPoint 97
  - Can use 2\textsuperscript{nd} CD with Office 2000
- Can have sound or movies
  - Automated gif run (from gallery) in Slide show view
  - Other animation need to click
  - Sound can be either way
- Can modify clipart
  - Ungroup and manipulate
Creating graphic

- Combine clipart
  - Use recolor or ungroup/regroup to modify clipart

- Use program such as Visio
  - Marketing type of diagrams
Bullet Animation

• Use build effects if using LCD or projector
  – Can use different colors on recent vs. old bullets
  – Cover up past points if using overheads (not best)

• Charts can also be animated
Builds

- Control over what audience sees
- Either main bullets or sub-bullets
- Can change color of last bullet
  - Shows that bullet is there, but can’t see it
- Similar to way presenter writes
  - One line at a time
When not to use builds…

• Talk about bullets for just a few seconds
• Vary once in a while
• Only have 3 or 4 bullets
• Two column bullets - grouping
Custom Builds

• Normally have one text area
  – Bullets build by main bullet or secondary bullet
• Can duplicate text areas
  – Especially when varied sub-bullets and dimming
## Slide without Build

<table>
<thead>
<tr>
<th><strong>Advantages</strong></th>
<th><strong>Disadvantages</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower price</td>
<td>Small company</td>
</tr>
<tr>
<td>Smaller profile</td>
<td>Limited service group</td>
</tr>
<tr>
<td>Better warranty</td>
<td>Last to market</td>
</tr>
</tbody>
</table>
## Slide with Build

### Advantages
- Lower price
- Smaller profile
- Better warranty

### Disadvantages
- Small company
- Limited service group
- Last to market
Slide Transitions

• Use transition effects if using projector
  – Be careful that they are long enough and interesting
  – Can use sound as effects- don’t overuse

• Advance slide with mouse/keyboard
  – Page Up/Page Down or left mouse

• Best to use at different sections
  – Can use color for different sections

• For overhead, use flipchart or whiteboard
• Blank screen (Shift-B)
Can also use right mouse button for emphasis

Don’t get carried away
Spelling/Punctuation

• Spell check
  – Just as easy to make a mistake in a few slides
  – Use SpellCheck at very end

• Be consistent with punctuation
  – Periods or no periods
Audience Handouts

• Helps focus audience to you
  – Give out either before or after
  – Print out 6 per slide
    • Can also Send to.. Microsoft Word
      – Incorporate with .pdf format

• Be careful about reverse print
  – Especially when using tables and printing handout
## Table with White Font Color

<table>
<thead>
<tr>
<th>Student</th>
<th>Test 1</th>
<th>Test 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>J. Smith</td>
<td>80</td>
<td>85</td>
</tr>
<tr>
<td>K. Kline</td>
<td>90</td>
<td>65</td>
</tr>
</tbody>
</table>
Table Appearance in Handout

<table>
<thead>
<tr>
<th>Student</th>
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<td>65</td>
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</tbody>
</table>
The Closing

• End should include summary slide
  – Key points
  – Conclusion
    • Relevant to audience

• Describe future options (if applicable)
  – Or a future strategy, plan and/or goal

• Last slide could be Thank You- with graphics
Dealing with technical slides

Planning

Reducing anxiety

Creating a presentation

Enhancing a Presentation

Dealing with Technical Slides

Practice

Delivery of Presentation

End
Technical Drawings

• Don’t show detailed drawing
  – Hard to see
  – Spend too much time on slide

• Break up into multiple slides
Detailed Drawing

- Hard to read
Detailed Drawing - alternative

- Show sections with descriptions
- First show how you are going to break it down
• Then discuss just that section
Using Images

• Can get from Internet or scanner
  – Be careful of copyright laws
  – For Internet
    • Click on right mouse button, and either View image or Save Image As…
    – Save in file and use Insert...Picture... File
• Use bullets under or to the side of image to explain
  – Don’t leave the image alone
State of the Art in Oscilloscopes

- Infinium is a 2 channel, 500 MHz oscilloscope from HP
  - 1-GSa/s sample rates
  - Simple, analog-like front panel
  - Windows® 95-based graphical user interface
  - Built-in information system
Using Equations

\[ \text{Average} = \frac{1}{T} \int_{0}^{T} x(t) \, dt \] [from 0 to T]

- Use Equation Editor - looks better
  - Or more powerful program MathType
    - Use in conjunction with bullets or standalone
- Use with Insert…Object command
  - Have free standing text
    - Will have to resize and move
  - Copy/Paste to another slide
Practice

Planning

Reducing anxiety

Creating a presentation

Dealing with Technical Slides

Enhancing a Presentation

Delivery of Presentation

End
Concepts of Practicing

- Practice at least 5-6 times
- Wait at least one or two days between reviews
- Practice in front of computer (simulation)
- What questions will audience ask?
  - Anticipate and put in presentation
- Can use video or audience after 3rd or 4th practice
Review Paradigm

1. Missing slides and general flow (quick review)
2. Problem words (talk)
3. Adding bullets/sub-bullets
4. Eye appeal and logical flow (modify style)
5. Clip art placement (or other visuals)
6. Trial practice with timing (last minute corrections)
7. Final practice/spell check
Delivery of Presentation

Planning

Reducing anxiety

Creating a presentation

Dealing with Technical Slides

Practice

Enhancing a Presentation

End
Use Voice Effectively

• Project voice
  – Face audience, not screen

• Voice inflection should vary
  – Visual complements audible
    • Think of Ben Stein

• Use pauses

• Enunciate
Eliminate Filler Words

Um

OK

Yes

You know

Pause, don’t speak
Use your body effectively

• Don’t lean on desk
  – Posture erect

• Relax hands, broad gestures

• Avoid talking with hands
  – Emphasize points only
Placement of overheads/others

- Place overheads close to speaker
  - Have good transition

- Don’t stand in front of overhead
  - Two B’s (blinded and block)
Stand near computer to change for slide show
  – Can use left mouse button
    • Don’t sit
Pointing out main ideas

- Finger Pointing
- Mouse Pointing
- Laser Pointing
“For very important talks, always have overheads as backups – for when you don’t, that is the time the computer will crash”

Murphy’s 3rd Law of Presentation
Summary

• Presented 7 main areas on technical presentations
• Know how to present AND know how to use application
  – Both are important
• Practice is the key
The End