Rethinking the Design
of Presentation Slides

Fillets reduce leading edge vortices in nature and in engineering

Fillet on dorsal fin of shark

Fillet on Seawolf submarine

[Deventer et al., 1991]

Source: Chapter 4 in *Craft of Scientific Presentations*

An advantage of using slides is that audiences remember more when the slides are well-designed

![Graph showing recall percentage]

Hear

See

Hear and See

Recall (%)
For a technical presentation, you should set high goals for the presentation slides:

- Slides should help the audience during the talk.
- Slides should serve as notes for the audience after the talk.
- Slides should serve colleagues having to make the same talk.

This presentation focuses on two common errors made in the design of slides:

- Creating slides that no one reads.
- Creating slides that no one remembers.

**Presentation Outline**

- Introduction
- Background
- Pre-Combustion Methods
  - Coal switching
  - Coal Cleaning
- Combustion Methods
  - Ammonia ignited bed
- Post-Combustion Methods
  - Absorption
  - Adsorption
- Conclusions
- Questions?
One common error is having a slide format that dissuades the audience from reading

To avoid this error, an easily read typography and layout are needed

Choose legible type
Sans serif type

Choose a helpful layout
words words words words
words words words words
words words words words
Much more effective than PowerPoint’s default layout is a sentence headline supported by images

The sentence headline succinctly states the main assertion of the slide

Body supports with images

Body supports with needed words

Much more effective than PowerPoint’s default layout is a sentence headline supported by images

Three criteria are important in evaluating a layout design for presentation slides

Fillets reduce leading edge vortices in nature and in engineering

How memorable is the design?

Fillet on dorsal fin of shark

How many slides does the design require?

Fillet on Seawolf submarine

Does the design help the slides stand as notes?

[Fillett & Devenport et al., 1991]
Fillets reduce leading edge vortices in nature and in engineering

Fillet on dorsal fin of shark

Fillet on Seawolf submarine

The sentence headline should state succinctly the purpose or assertion of the slide

A strong headline—

identifies the slide’s purpose for the audience

identifies the slide’s purpose for the speaker
**Results**

Without Fillet

**Computations show that the fillet prevents the leading edge vortex and delays the passage vortex**

With Fillet

Without Fillet

- **Passage vortex**
- **Leading edge vortex**

With Fillet

- **Passage vortex**
- **Leading edge vortex**
The body of a slide should support the headline primarily with images and with words where needed.

Primarily supports with images

Supports with necessary words

clear  familiar  concise

Measurements show that the fillet prevents formation of the leading edge vortex.

Velocity profile: vane without fillet

Velocity profile: vane with fillet
Hefner developed a dynamic thermal-electrical model of a temperature-dependent IGBT, which was then modeled in terms of the instantaneous electrical and thermal behavior of the silicon chip. The model and data were used to simulate the SABER circuit and determine the effect of the temperature of the chip on the IGBT behavior.

Adams, Joshi and Blackburn are modeling of thermal and electrical behavior using several commercial softwares (I-DEAS, Maxwell, Flotherm and Saber) and 3-D, transient approaches.

**Joint Force Projection Concept/Requirement - AXXI**

**Enabling Strategic Maneuver - (Circa 2010)**

**Initial Deployment Force**
- 96 hrs Ready to Fight

**Contingency Response Force**
- Division (-) closes in 120 hrs
- Forces & Ready to Fight

**Advanced Full Force Operations**

- **Deployment**
  - Initial Deployment Contingency Response Force (Air) – Ready to fight in 96 hours
    - 2brigade/Task Force (Division level)  
    - Mission tailored  
    - Subordinate to JTF  
    - “In-stride” coordination & team building  

- Immediate Reinforcement Force (Air) – Ready to fight in 120 hours
  - Active Mech Brigade + Support & Strike Force  
  - Mission tailored  
  - “Plunge” into Initial Deployment Force HQs  
  - Joint Force support

**Continuum of Early & Continuous Joint Operations**

- Sustained, decisive ground operations  
- Conflict Termination on US dictated terms

**Extended Operations**
- Campaign Forces: Corps w/ 3 Divisions (+)
- (Sra/Air) – Ready to fight by C + 30
  - Mech/Amphib Inf Division mix  
  - Capable of conducting sustained, decisive operations as part of Joint Force
  - Follow-on Forces (E- Bde & additional divisions as required)

**Too busy**
A second common error is showing slides that the audience reads, but does not remember.

Presentation Outline

- Introduction
- Background
- Pre-Combustion Methods
  - coal switching
  - coal cleaning
- Combustion Methods
  - atmospheric fluidized bed
- Post-combustion Methods
  - adsorption
  - absorption
- Conclusions
- Questions?

To make slides memorable, you have to consider what to include and what to exclude.

This presentation compares several methods for reducing emissions of sulfur dioxide.
Slides should include key results and images

Results

Images

Temperature Ratio

Pressure Ratio

Slides should also include signals for the presentation’s organization

Beginning

Middle

Ending
Computational Analysis of the Aerodynamic Energy Required of Morphing Wings

Greg Pettit, Harry Robertshaw, and Daniel J. Inman
Center for Intelligent Materials, Systems and Structures
Air Force Office of Scientific Research (F49620-99-1-0294)

CIMSS
This presentation evaluates composite materials for the bipolar plates of fuel cells

Role of bipolar plates in fuel cells

Comparison of bipolar plate materials

Evaluation of bipolar plate performance

An arresting system shortens the landing distance without sacrificing aircraft performance

Arresting system for aircraft carrier
In summary, the phantom for blood perfusion has many useful applications.

The phantom can—

produce reasonable and reproducible perfusion
allow for simple and inexpensive construction
be modified for future experiments

Questions?

Questions?

Missed Opportunity
Review of Test Data Indicates Conservatism for Penetration

- The existing SOFI on tile test data used to create Crater was reviewed along with STS-87 Southwest Research data.
  - Crater overpredicted penetration significantly:
    - Initial penetration to describe normally
      - Varies with volume/mass of projectile (e.g., 200 ft/sec for 3 cu.in.)
    - Significant energy is required for the softer SOFI particle to penetrate the coating
      - It is possible at sufficient mass
    - Comparing with SOFI penetrated SOFI can cause significant damage
      - Flight condition is significantly outside of test database
    - Volume of ramp is 1920 cu in vs 3 cu in for test

In summary, the slide design given here is much stronger than PowerPoint’s default design

- Fillets reduce leading edge vortices in nature and in engineering
- The design is more memorable for audience
- The design requires fewer slides (thus better pacing)
- The design produces notes that stand alone
- The design creates a more compelling argument

Summary: page 116 in Craft of Scientific Presentations
Templates: http://writing.eng.vt.edu/csp.html