

Session 6

Graphics

Communications and Intuition

Review of last time: Course Project Proposals

6/2

- Course project requirements
 - Gathering and understanding requirements are important parts of your project
 - Examples of requirements
 - How to gather requirements systematically
- Course project proposals
- How to merge workbooks

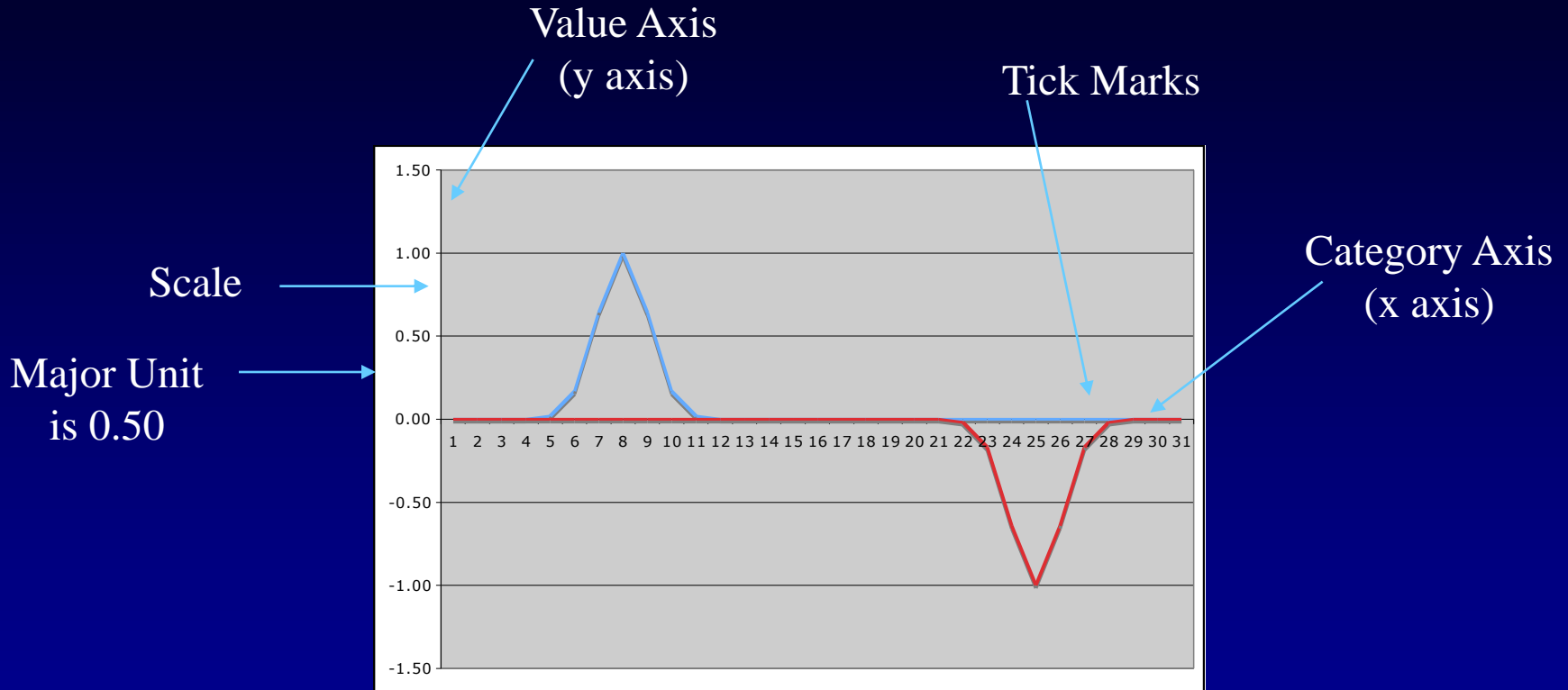
- Graphics includes
 - “Graphs” and “Charts”: graphical representation of quantitative data
 - Graphical formatting elements on worksheets: fonts, color, symbols, shading, etc.
- Graphics help to “guide the eye” to make the worksheet or presentation easier to understand
- Graphics facilitate communications
 - When you’re explaining a model or persuading others of its meaning
 - When you’re developing, maintaining, or just understanding
- Graphics facilitate intuition
 - Understand the model
 - Uncover inconsistencies and errors
 - Uncover fundamental design errors

- Use color sparingly, but use it
 - Highlight significant features: user input, output, parameter blocks, ...
 - Keep the color count low: three or four at the most
 - Don't use color for design elements: row captions, column headings, ...
- Color the backgrounds, not the text
 - Text color is hard to see
 - Background color stands out well
 - For presentations use dark colored backgrounds, light colored text
 - For print and on screen, use light backgrounds, dark text
- Use graphical elements sparingly and consistently
 - Borders
 - Arrows (be careful about obstructing data)
 - Avoid patterns

Graphical representations: The big picture

6/5

- Three channels of “written” communication
 - Text
 - Tables (data, usually numeric)
 - Graphics
 - Pictorial/schematic
 - Data representation (charts and graphs)
- New channels are under development (Multimedia)
 - Video
 - Full motion photography
 - Animation
 - Audio
 - Narration
 - Music



- Grid lines
- Category labels
- Legend
- Data markers
- Plot Area
- Data series
- Arrows
- Chart Title
- Attached text

Excel's chart types

- Line family
 - Line
 - Area
 - 3-D Line
 - 3-D Area
- Bar/Column family
 - Bar
 - Column
 - Stacked column
 - 3-D Bar
 - 3-D Column
 - 3-D Perspective column
 - Cylinder/cone/pyramid
- Pie family
 - Pie
 - 3-D Pie
 - Doughnut
- Other
 - Scatter
 - 3-D Surface
 - Radar
 - Bubble
 - Volume/Hi/Lo/Close
- Combinations

- Line
 - Continuous categories
 - Time evolution
- Stacked Area: time evolution of a pie chart
- Bar/Column
 - Discrete categories (and only a few)
 - Unordered categories
- Pie
 - Single data series: pie
 - Multiple series: doughnut
 - Relative sizes of categories carry all the information
- Radar: Not often used in financial applications
- Scatter: Correlations

- The key to effective charts:

Simplicity

- Charts are difficult to absorb
 - The reader needs a minute to figure it out
 - Make that minute painless
 - Guide the eye — use an uncluttered format
- Avoid 3-D, perspective, gimmicks (unless you want to mislead)

- Use a single font
 - When too many lettering styles are mixed together, readability suffers
 - Stick to a single font
- Use initial capitals
 - Use leading capitals instead of all capital letters
 - All caps are hard to read and tend to lose the emphasis you want
- Break up complex charts into two or more charts
- Focus on one point
 - Keep visual elements to a minimum
 - Incidental art can have great eye appeal, but when you add too many fancy frills, your message gets lost in the clutter

- Minimize special effects
 - Unless you're trying to achieve a one-time dramatic effect, avoid:
 - Too many colors
 - Using too bright colors
 - Overly ornate typefaces
 - Avoid outline and shadow typefaces
 - Avoid underlining
- Use traditional orientation
 - Your reader is used to reading text from left to right, top to bottom
 - Other orientations usually detract from a presentation (except landscape pages)
- Keep text format consistent
 - Unexpected shifts in text type style disturb the reader's attention.
 - Proof: Magazine ads have text format *inconsistent* with the rest of the magazine. The ad creator *wants* to disturb your attention!
 - If the chart is part of a document, match the document's font

- Avoid nonessential values and grids on graphs
 - Such extraneous details can obscure your message
 - They need to be proofread and maintained
- Keep graphs simple
 - Don't overlay too many lines or other graphic elements
 - Simple graphs are more easily grasped
- Round numbers on graphs
 - Round off numbers and use axis titles that indicate the rounding
- Start graph axis values with zero
 - Axes that start in mid-scale can confuse and mislead
 - Reader might think you are trying to mislead
- Avoid perspective views and slanted chart objects
 - They mislead the reader
 - Can create an impression different from what you intend

- Chart border
 - Use a border around the chart if it is inserted into a document text
 - Borders aren't needed if the chart is on its own page
- Match the page numbering of the main document
- Arrows
 - Use very sparingly
 - They tend to add to a cluttered look

Basic steps for building a chart

6/14

- Select the range containing data and category names; it's best if they're contiguous
- To create a chart in Excel 2000-4
 - Invoke the Chart Wizard
 - The steps guide you to setting a title, legend, series, etc
 - In the last dialog window, you can choose to embed the chart on any sheet, or to include it in the workbook as a new sheet
 - Click and drag to set size and position of the chart object
- To create a chart in Excel 2007
 - On the Insert Ribbon, choose the chart type
 - After you create the basic chart type, modify it using ribbon tools and shortcut menus

◆ Sales
SalesPie
Mailings
Mailings3D

- Remember that data format becomes the scale format
- Navigate with the arrow keys
- Double-click a chart feature to expose its format dialog
- Use chart AutoFormats to define and save chart styles
- Using names reduces chart maintenance effort
- “Data Adjustment” (Prior to Excel 2007)
 - Command+Click on Mac
 - Control+Click in Windows

- Graphics are an effective means of communicating numerical relationships
- Graphics are an effective means of developing your intuition about models
- The Chart Wizard is the most effective way to produce a chart
- Use graphics features and styles sparingly
 - Avoid the cluttered look
 - Avoid the “ransom note” effect of multiple fonts
- Use links to create data tables to drive your charts — avoid copying data
- Use links for attached text when that text would require maintenance
- Use Excel names to reduce chart maintenance effort

- Jones, Gerald E. *How to Lie with Charts*. San Francisco: Sybex, 1995.
- Microsoft Excel User's Guide.
- Walkenbach, John. *Excel 2003 Bible*. John Wiley & Sons, 2003.
- Walkenbach, John. *Excel 2007 Bible*. John Wiley & Sons, 2007.
- Tufte, Edward R. *The Visual Display of Quantitative Information*. Cheshire, CT: Graphics Press, 1983.
- Tufte, Edward R. *Envisioning Information*. Cheshire, CT: Graphics Press, 1990.

Preview of next time: Managing Modeling Projects

6/18

- Management is like steering
 - Know where you are
 - Know where you want to go
 - Know what you have to do to get there
- Six cultural patterns of modeling process capability
- Key process areas for spreadsheet modeling