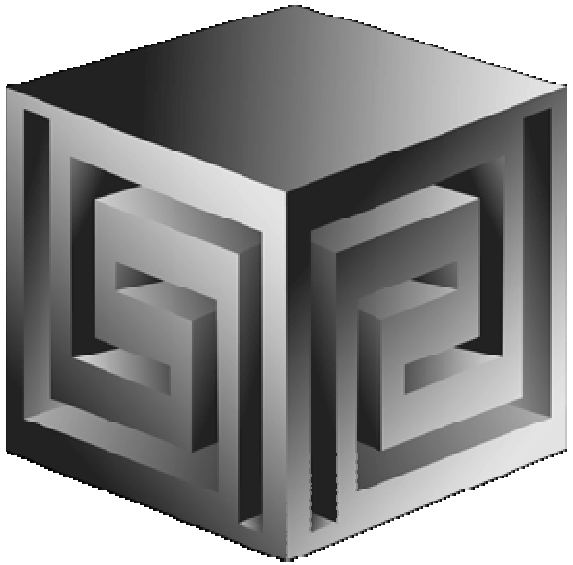
Lies, Damn Lies, and Visualizing Data with Oracle BI

ODTUG Kaleidoscope 2008



Dan Vlamis

Tim Vlamis

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Vlamis Software Solutions, Inc.

- **Founded in 1992 in Kansas City, Missouri**
- **Oracle Partner and reseller since 1995**
- **Specializes in ORACLE-based:**
  - **Data Warehousing**
  - **Business Intelligence**
  - **Data Transformation (ETL)**
  - **Web development and portals**
- **Delivers**
  - **Design and integrate BI and DW solutions**
  - **Training and mentoring**
- **Expert presenter at major Oracle conferences**
- **www.vlamis.com (blog, papers, newsletters, services)**

Vlamis Kaleidoscope Presentations

Presenter	Time	Title
Cathye Pendley	Tue 9:15-10:15	Building Cubes and Analyzing Data using Oracle OLAP 11g
Tim Vlamis	Wed 9:15-10:15	Lies, Damn Lies, and Visualizing Data with Oracle BI
Dan Vlamis	Wed 2:45-3:45	Oracle BI, Oracle OLAP, Essbase – The Benefits and Cost of Openness

Tim Vlamis' Bio

- 20+ years experience in business modeling and valuation, forecasting, and scenario analyses.
- Expert in principles and elements of design.
- Expert in curriculum development and pedagogical theory.
- Professional Certified Marketer from AMA.
- Active Member of NICO (Northwestern Institute on Complex Systems).
- MBA Kellogg School of Management (Northwestern).
- BA Economics Yale University.

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Overview

- **Principles of Design and Data Visualization**
- **Graphs versus Tables**
- **Types of Graphs and when to use them**

Business is Simple!

"Vision is the art of seeing what is invisible to others."

Jonathan Swift, 1667-1745

Mooers's Laws

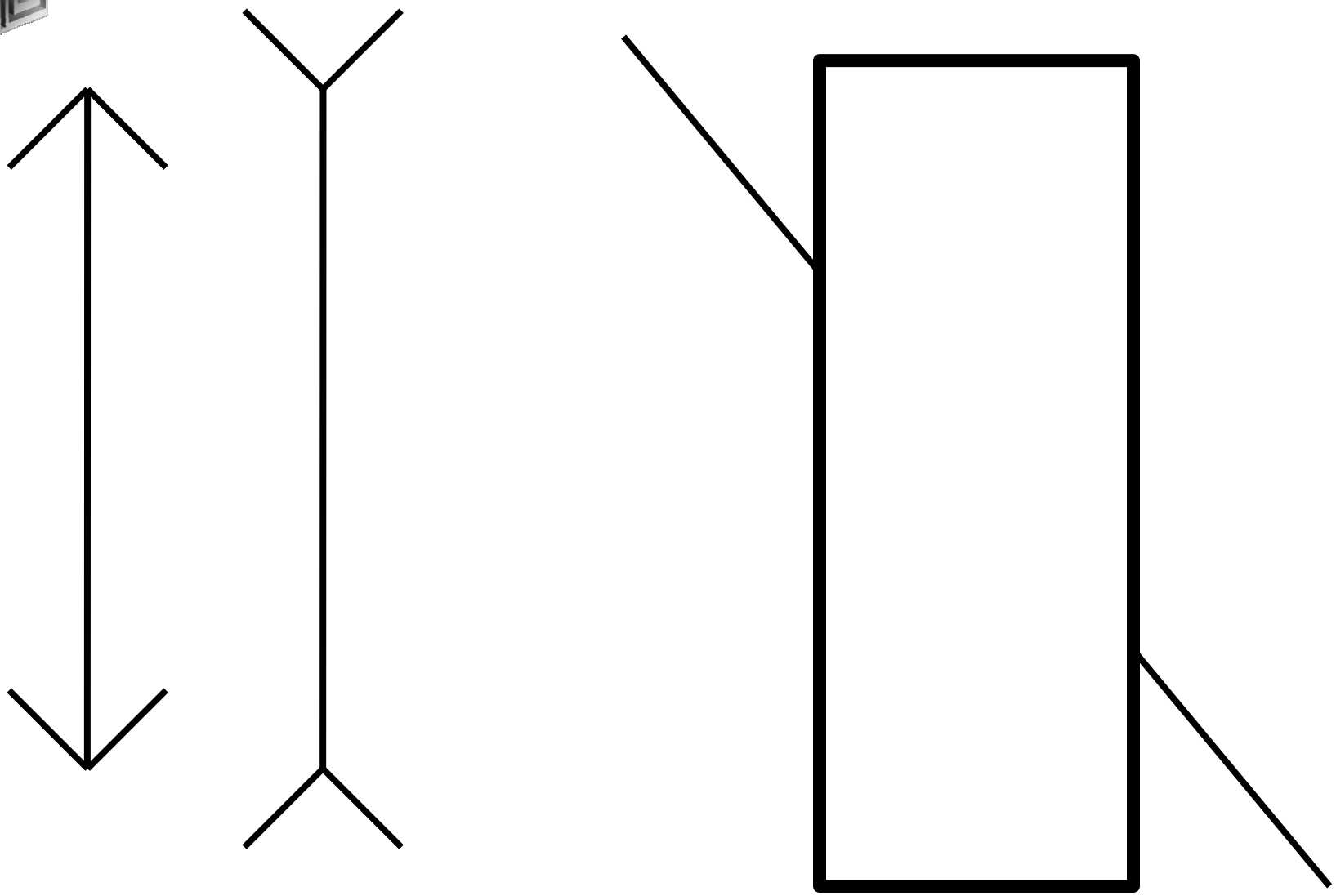
- **An information retrieval system will tend not to be used whenever it is more painful and troublesome for a customer to have information than for him not to have it.**
- **Where an information retrieval system tends not to be used, a more capable information retrieval system may tend to be used even less.**

Calvin Mooers 1959

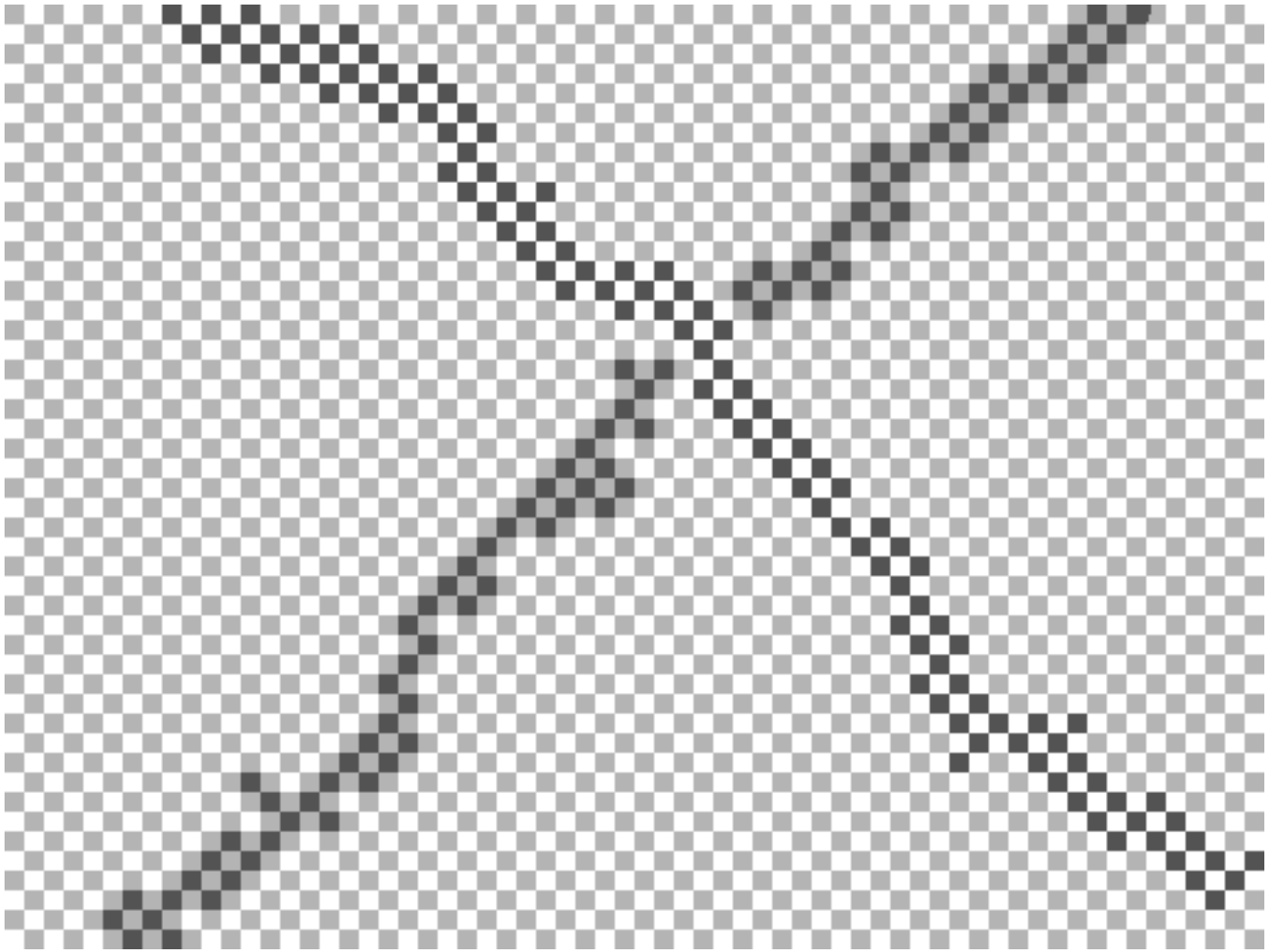
- **BI reports and dashboards should be viewed primarily as communication devices.**

- **Both the principles of human cognition and the needs of the individual user should help guide their proper use.**

Classic Optical Illusions



How many colors do you see?



There are only 3 colors: White, green, and pink.
There seem to be two different shades of pink,
but there is only one pink.

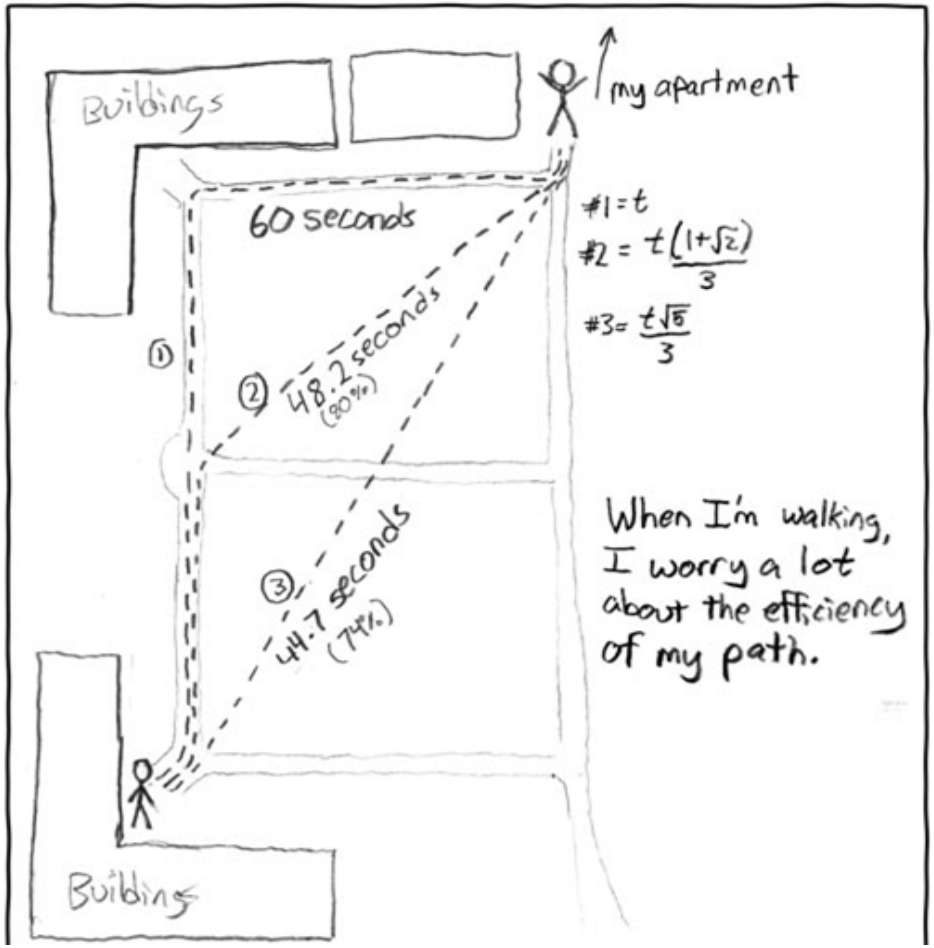
Universal Principles of Design

- **Guiding concepts or ideas that help us evaluate the relative strengths of a work.**
  - **Unity**
  - **Harmony**
  - **Balance**
  - **Rhythm**
  - **Proportion and Scale**
  - **Emphasis or Dominance**
  - **Variation**

Primary Uses of BI Reports & Dashboards

Exploration

Explanation



xkcd.com

Strong Foundations

- **It's much easier to misuse BI tools than to use them well.**
- **Do a few things well and build from there.**

Tufte's 5 Principles

- **Above all else show the data.**
- **Maximize the data to ink ratio.**
- **Erase non-data ink.**
- **Erase redundant data ink.**
- **Revise and edit.**

Vlamis' 5 Principles

- **Maximize data to ink ratio.**
- **Match data format with viewer needs, explain or explore.**
- **Match data scale with data precision.**
- **Don't misrepresent data.**
- **Use color carefully.**

Communication is about perception, not reality.

Graphs and Tables

- **Graphs and Charts depict visual representations and relationships.**

- **Tables show data organized for lookup of specific, precise values or items.**

Keys to Effective Tables

- **Provide a search interface.**
- **Avoid scrolling if possible.**
- **Lock headers and titles if use scrolling.**
- **Display significant figures.**
  - **Don't imply precision that doesn't exist.**
- **Judiciously use conditional formatting for data exploration.**
- **Avoid putting text in color.**
- **Alignment, proximity, contrast.**

Bad Table

		WIDGETS TO GADGETS RATIO CALCULATED USING CHECK LEVEL DETAIL					
		ELECTROMECHANICAL			PNEUMATIC		
	PERIOD	IN-STORE	WEBSITE	DISTRIBUTOR	IN-STORE	WEBSITE	DISTRIBUTOR
INCLUDES ONLY DATES FROM JANUARY THRU OCT 2007	PERIOD 1	22.36%	11.37%	83.00%	85.34%	20.90%	46.80%
	PERIOD 2	21.22%	15.25%	81.00%	81.31%	18.01%	35.39%
	PERIOD 3	21.64%	13.22%	82.00%	78.29%	29.94%	41.28%
	PERIOD 4	20.89%	13.44%	82.00%	47.82%	16.30%	39.46%
	PERIOD 5	21.90%	13.24%	81.00%	84.58%	17.19%	20.52%
	PERIOD 6	25.09%	14.78%	80.00%	59.93%	31.08%	35.14%
	PERIOD 7	26.23%	14.98%	79.00%	36.35%	32.85%	22.52%
	PERIOD 8	26.83%	13.08%	80.00%	82.10%	30.41%	36.10%
	PERIOD 9	23.79%	14.27%	81.00%	43.40%	25.17%	23.81%
	PERIOD 10	24.39%	12.61%	82.00%	38.21%	17.70%	40.30%

Better Table

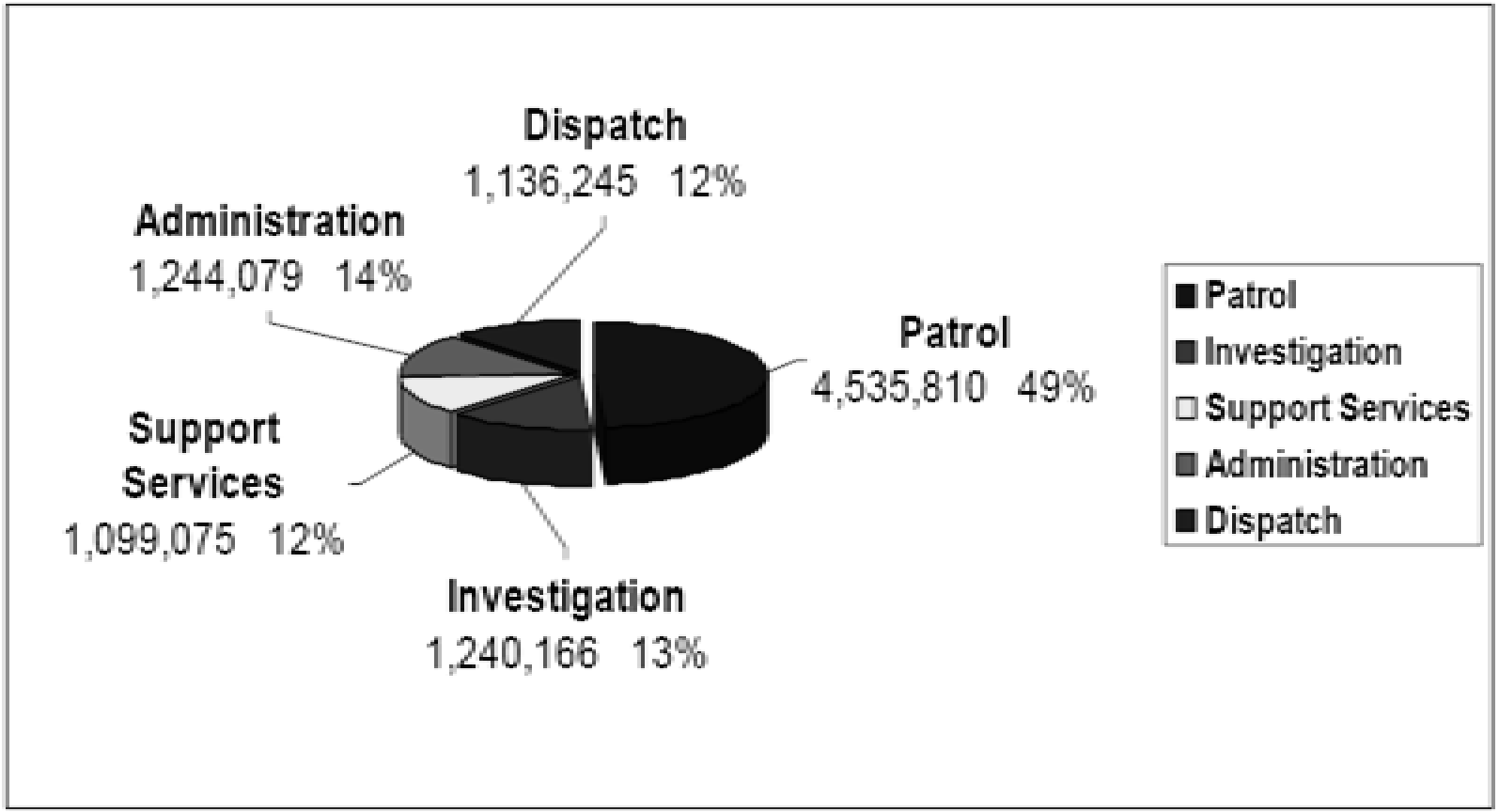
Widgets to Gadgets R

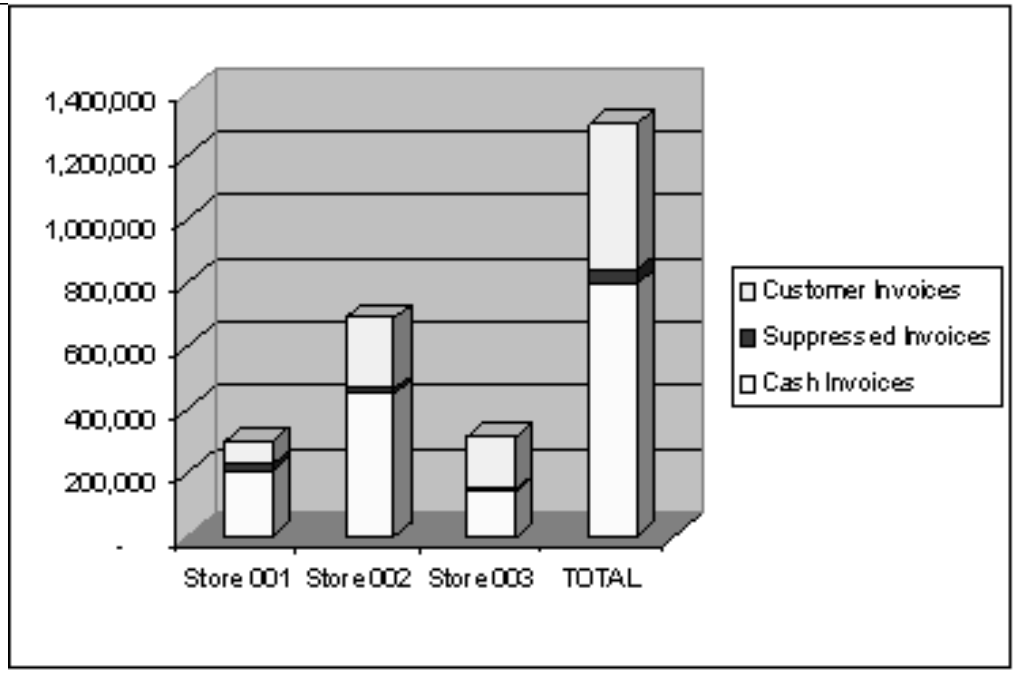
	Electromechanical			Pneumatic		
Period	In-store	Website	Distributor	In-store	Website	Distributor
1	22%	11%	83%	51%	21%	40%
2	21%	15%	81%	74%	21%	32%
3	22%	13%	82%	48%	22%	23%
4	21%	13%	82%	58%	31%	30%
5	22%	13%	81%	52%	19%	28%
6	25%	15%	80%	87%	15%	22%
7	26%	15%	79%	51%	23%	20%
8	27%	13%	80%	44%	22%	45%
9	24%	14%	81%	54%	17%	31%
10	24%	13%	82%	75%	31%	29%

Ratios calculated using check level detail.

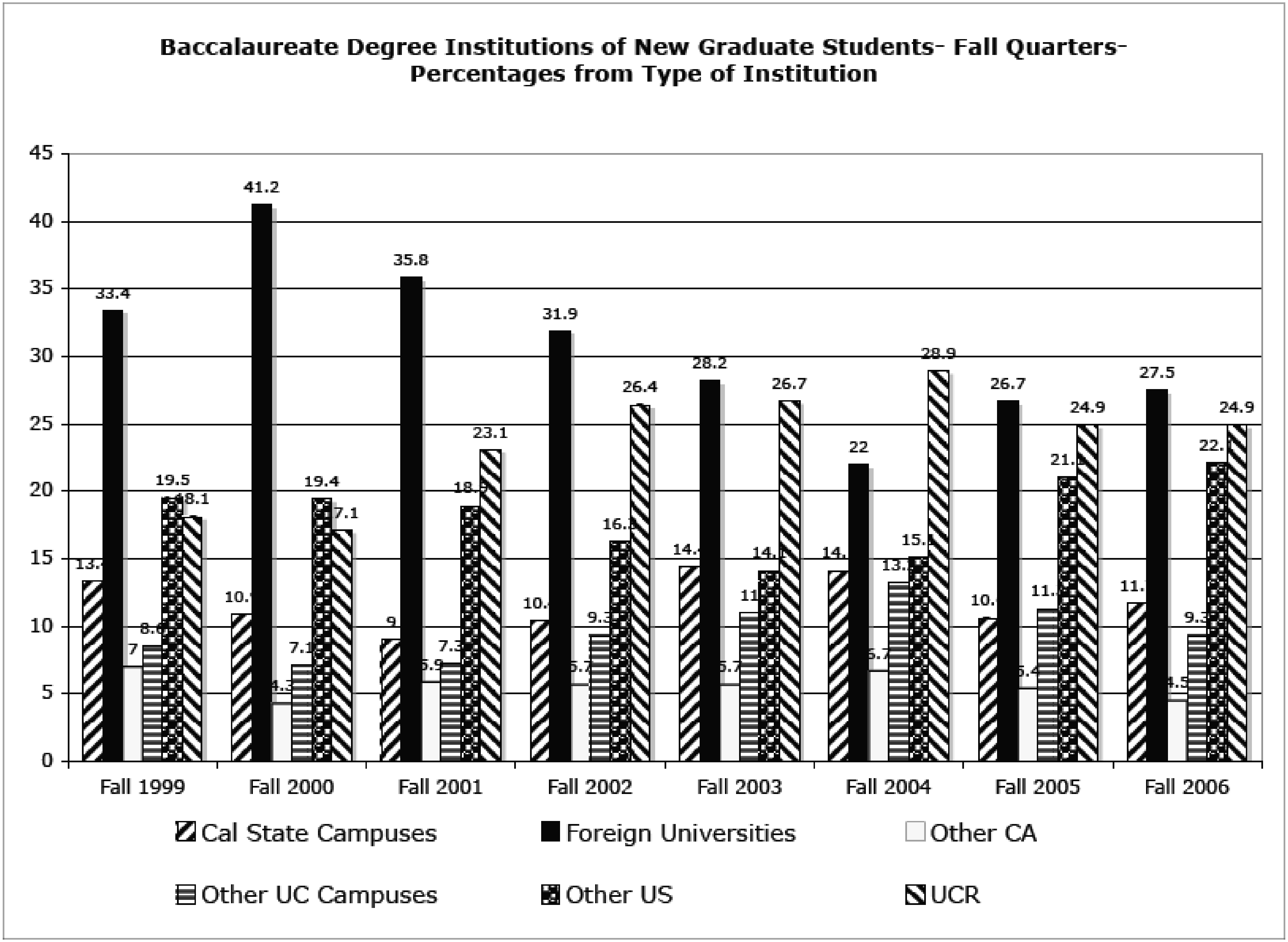
Periods include Jan - Oct 2007

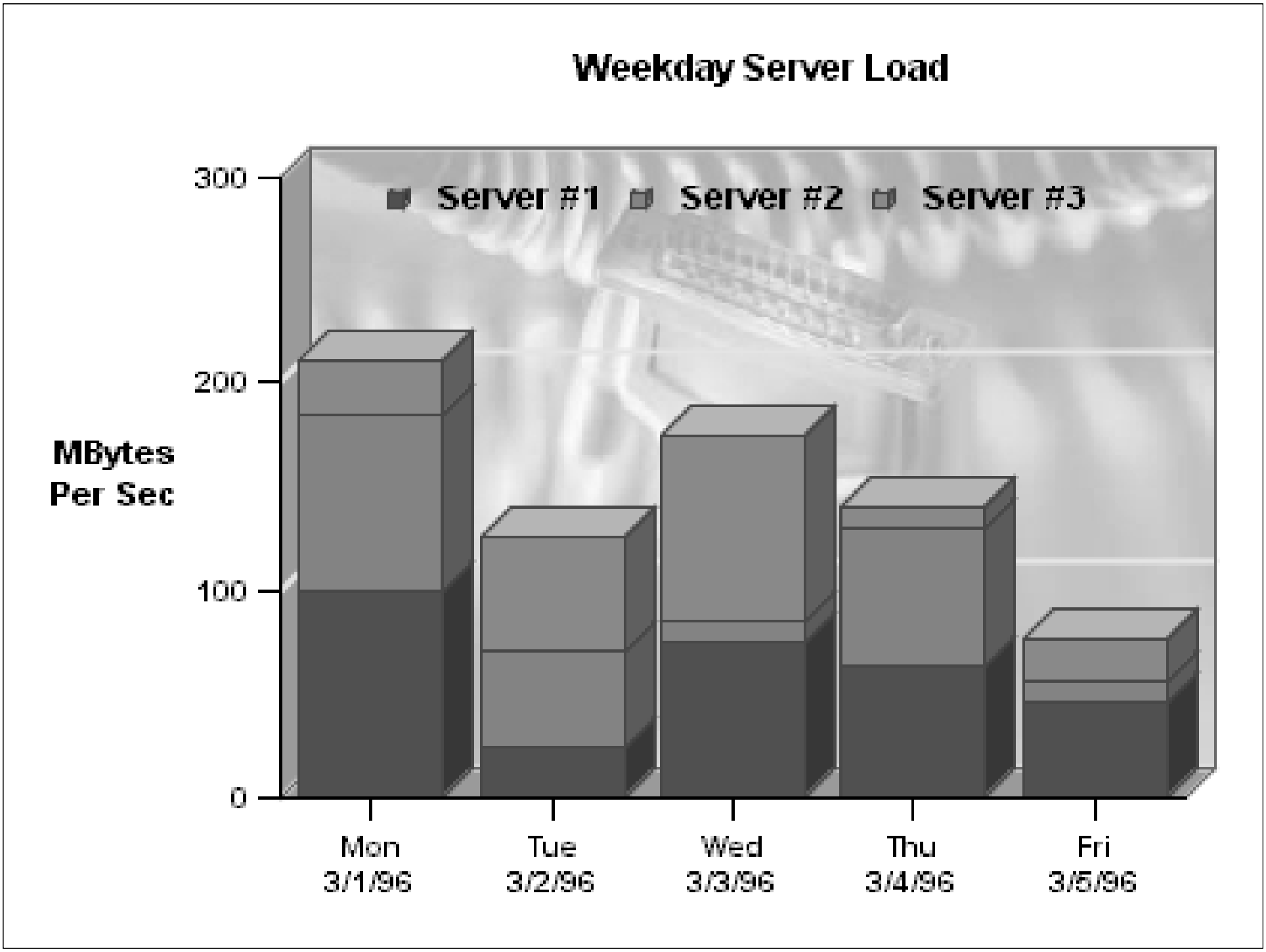
2004 - 2005 Budget





	Store 001	Store 002	Store 003	TOTAL
Total Invoices	298,943	687,091	313,140	1,299,174
less				
Cash Invoices	207,256	449,064	141,305	797,625
leaves				
Non-cash Invoices	91,687	238,027	171,835	501,549
consisting of				
Suppressed Invoices	18,888	15,527	6,501	40,916
and				
Customer Invoices	72,799	222,500	165,334	460,633
for purchases from				
Suppressed Customer Names	2,123	4,306	870	7,299
and				
Active Customer Names	2,103	14,747	8,342	25,192
which include				
Duplicate Customer Names	70	693	619	1,382
leaving				
Unique Customer Names	2,033	14,054	7,723	23,810
which include				
Bad Addresses	1,055	5,759	2,406	9,220
leaving				
Mailable Customer Names	978	8,295	5,317	14,590

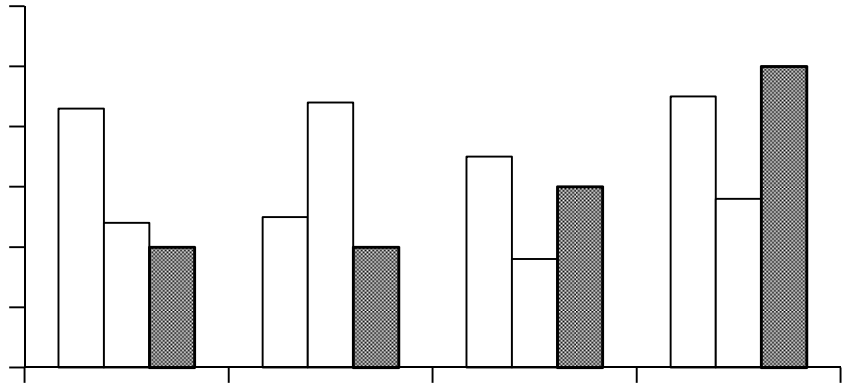

Baccalaureate Degree Institutions of New Graduate Students- Fall Quarters-
Percentages from Type of Institution
45
40
35
30
25
20
15
10
5
0
33.4
41.2
35.8
31.9
28.2
22
26.7
27.5
19.5
19.4
23.1
26.4
26.7
28.9
24.9
24.9
7
8.6
7.1
7.3
9.3
9.3
4.3
5.9
5.7
5.7
5.4
4.5
Fall 1999
Fall 2000
Fall 2001
Fall 2002
Fall 2003
Fall 2004
Fall 2005
Fall 2006
Cal State Campuses
Foreign Universities
Other CA
Other UC Campuses
Other US
UCR


Weekday Server Load
Server #1
Server #2
Server #3
300
200
100
0
MBytes
Per Sec
Mon
3/1/96
Tue
3/2/96
Wed
3/3/96
Thu
3/4/96
Fri
3/5/96

"With great power comes great responsibility."

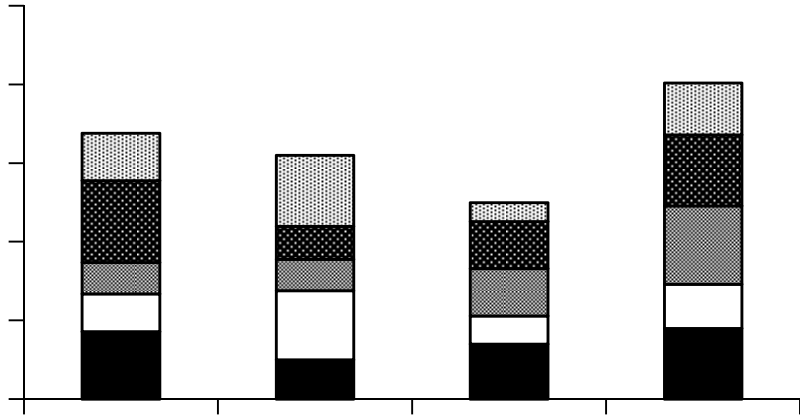
Uncle Ben to Peter Parker, Spiderman 2002

Bar Charts



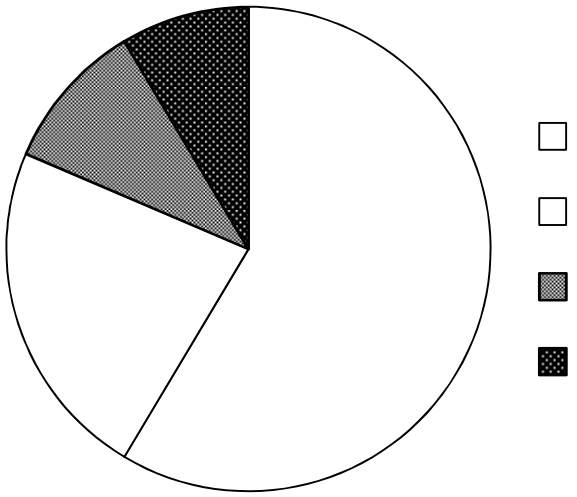
- **Show nominal data values in comparison to one another.**
- **Start with zero.**
- **If use a logarithmic scale, clearly notate.**

Stacked Bar Chart



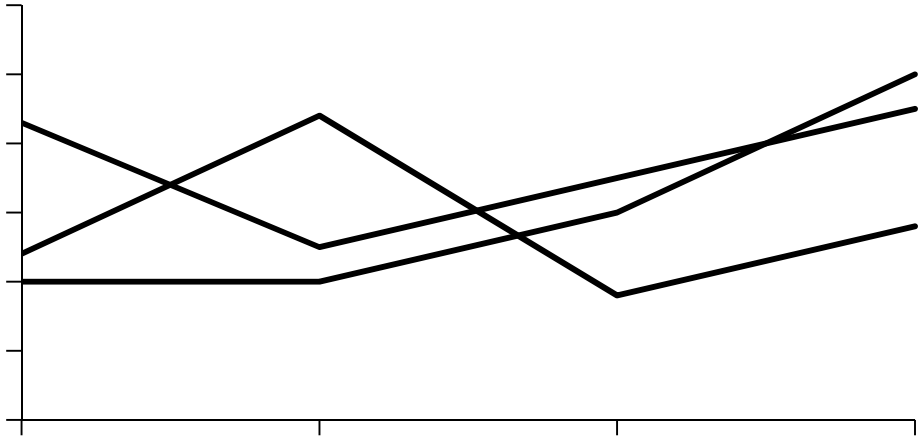
- **Somewhat confusing, not great for representing change.**
- **Total is most clearly represented number.**
- **Typically stack with largest values on the bottom.**
- **Single scale can make for interesting intra-bar comparisons.**

Pie Charts



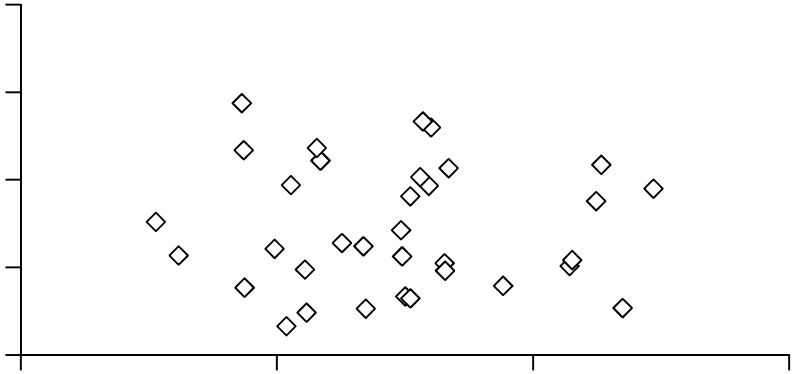
- **Typically used for showing parts of whole by percentage.**
- **Not great for piece to piece comparisons.**
- **Limit number of pieces.**
- **Can be interesting to show lots of pies together if significant differences exist.**
- **Stephen Few hates them.**
- **Do not use 3-D.**

Line Chart



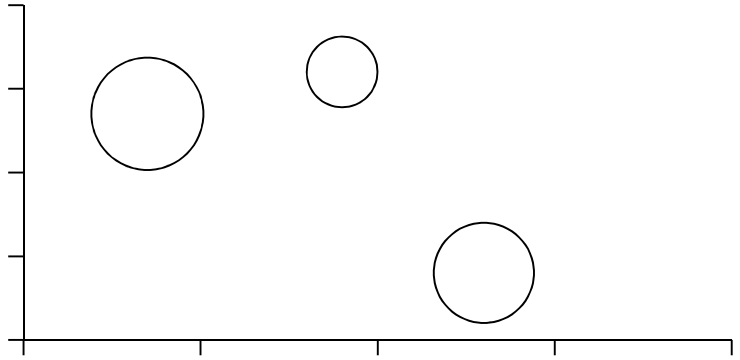
- **Show a pattern or progression over a continuous range or period.**
- **Can be valued within a range to highlight a particular pattern (careful!).**
- **Maintain a rectangular shape close to golden proportion.**

Scatter Plot



- **Shows single data points at the intersection of two values.**
- **Often depict a large number of discrete data points (hundreds or thousands).**
- **Useful for seeing the patterns in comparisons of two variables.**
- **Trend lines are often added.**
- **Clearly notate if use logarithmic scale(s).**

Bubble Chart



- **Special type of scatter plot.**
- **Size of bubble is related to a third variable.**
- **Greatly reduces number of points that can be depicted.**
- **Best for depicting approximate values and comparisons.**

Hyperion Visual Explorer

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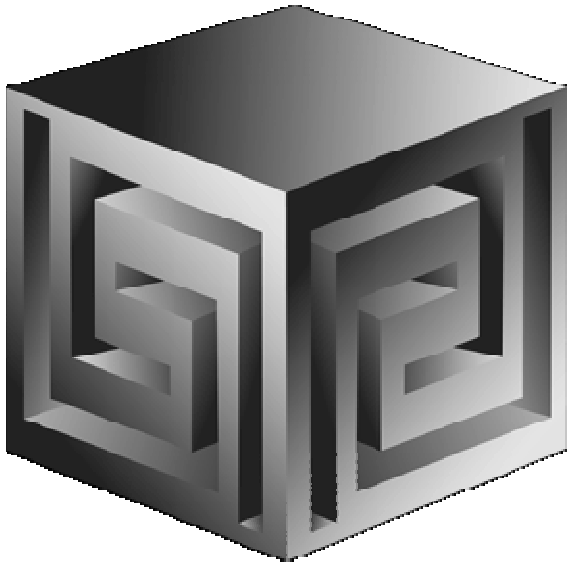
June 18, 2008



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