

Data Visualization In Oracle Business Intelligence 11g

Heartland OUG October 20, 2011

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VlamiS Software Solutions, Inc.

- Founded in 1992 in Kansas City, Missouri
- Oracle Partner and reseller since 1995
- Developed more than 200 Oracle BI systems
- Specializes in ORACLE-based:
 - Data Warehousing
 - Business Intelligence
 - Data Transformation (ETL)
- Delivers
 - Design and integrated BI and DW solutions
 - Training and mentoring
- OBIEE 11g beta program participant
- Expert presenter at major Oracle conferences
- www.vlamiS.com (blog, papers, newsletters, services)



Dan Vlami's Bio

- Developer for IRI (former owners of Oracle OLAP).
- Founded Vlami Software in 1992.
- Wrote portions of Oracle Sales Analyzer.
- Beta tester for Oracle products including OBIEE 11g.
- Oracle ACE.
- Expert speaker at Oracle conferences.
- Co-author of new book "Oracle Essbase & Oracle OLAP".
- BI/DW/EPM Track Chair for 2010 Collaborate Conference.
- BA Computer Science Brown University.

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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 (PCM) 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

- Cognition, Data Visualization, and Principles of Design
- Graphs versus Tables
- Tips for Tables
- Types of Graphs and when to use them
- Visualizations with Oracle BI
- BI Implementation Success
- Review and Summary



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

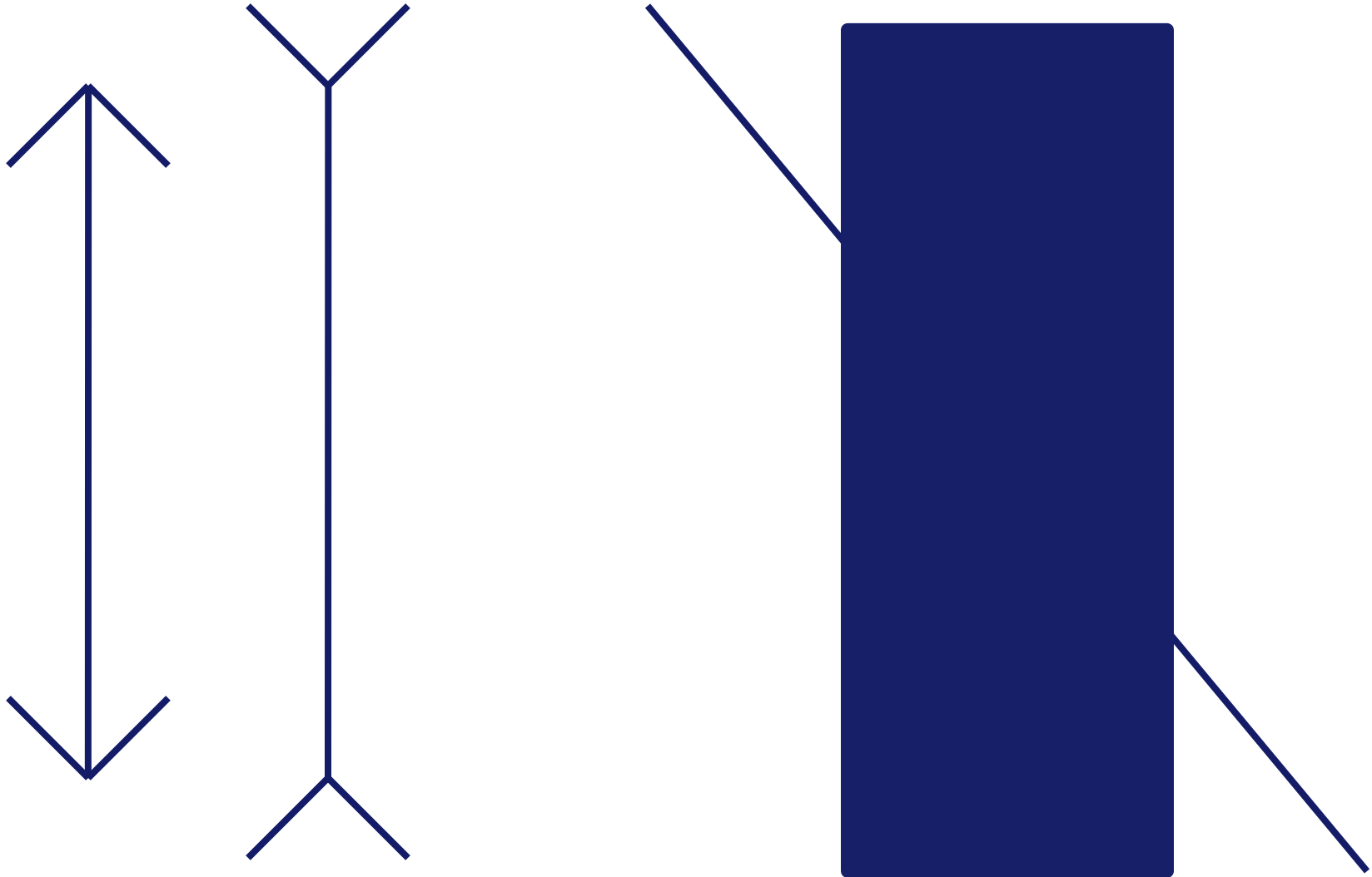


Commonly Overlooked BI Fundamentals

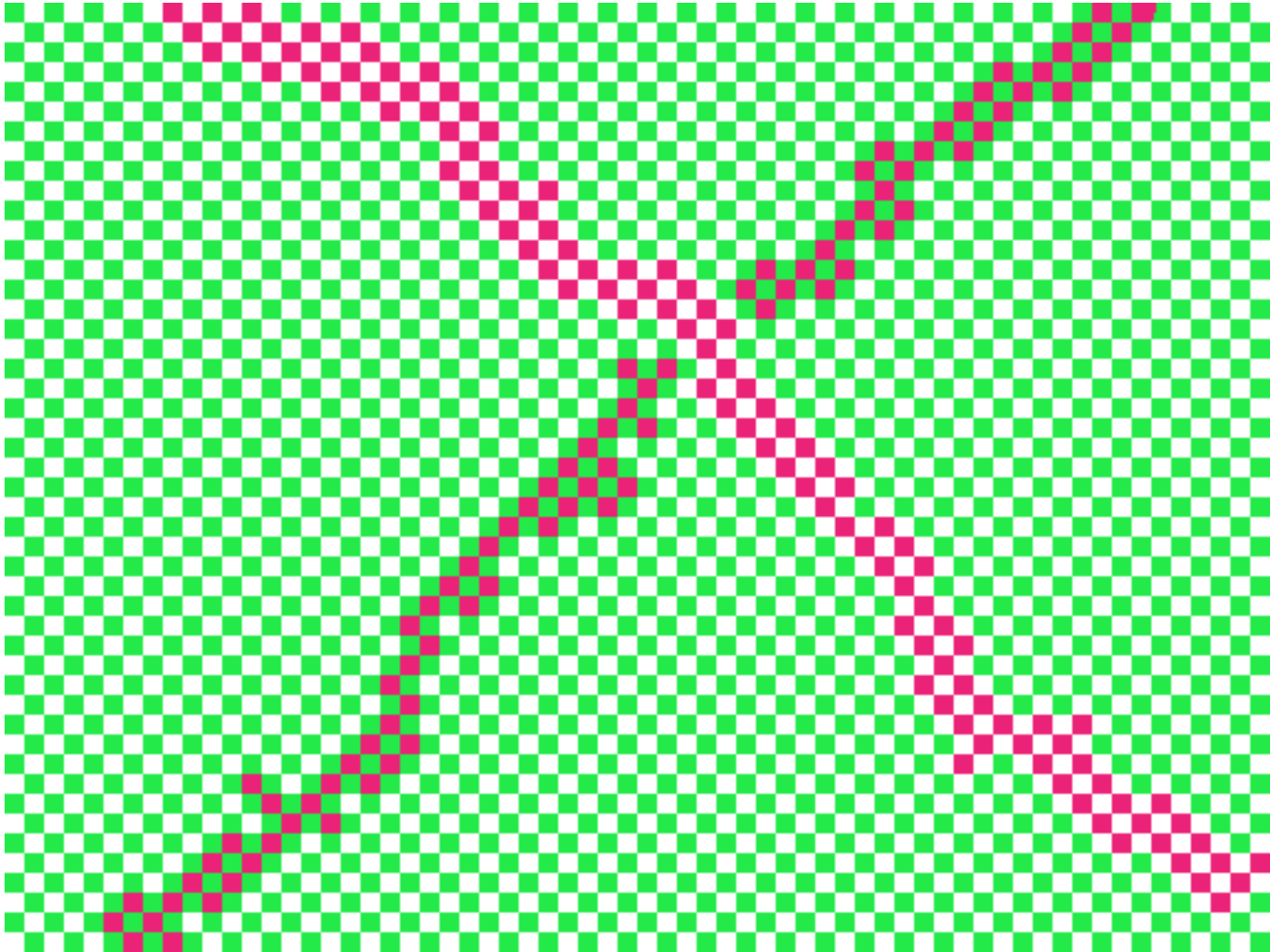
- BI reports and dashboards should be viewed primarily as communication devices.
- Both the principles of human cognition and the needs of the individual user should help guide their proper use.



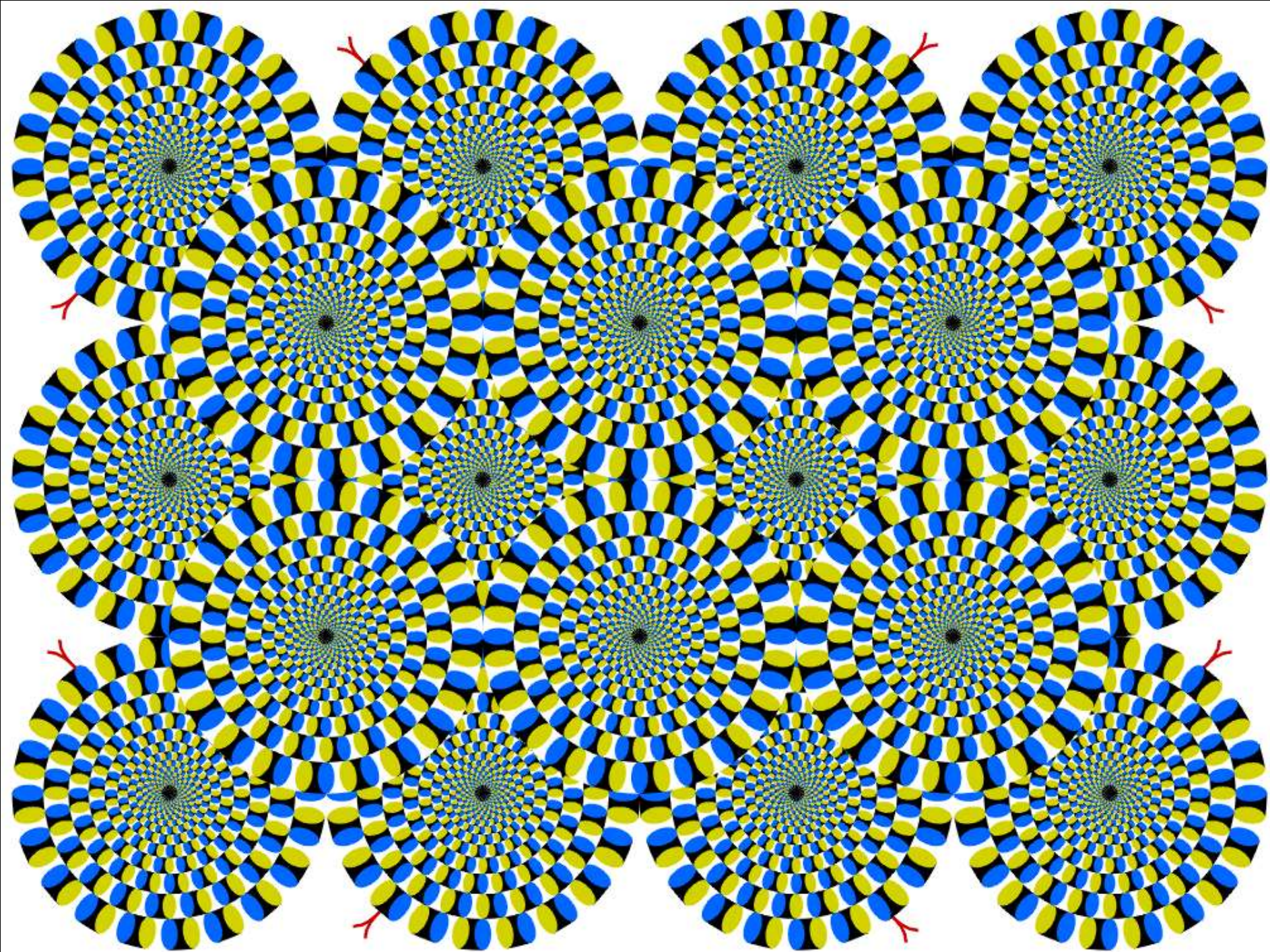
Classic Optical Illusions



How many colors do you see?

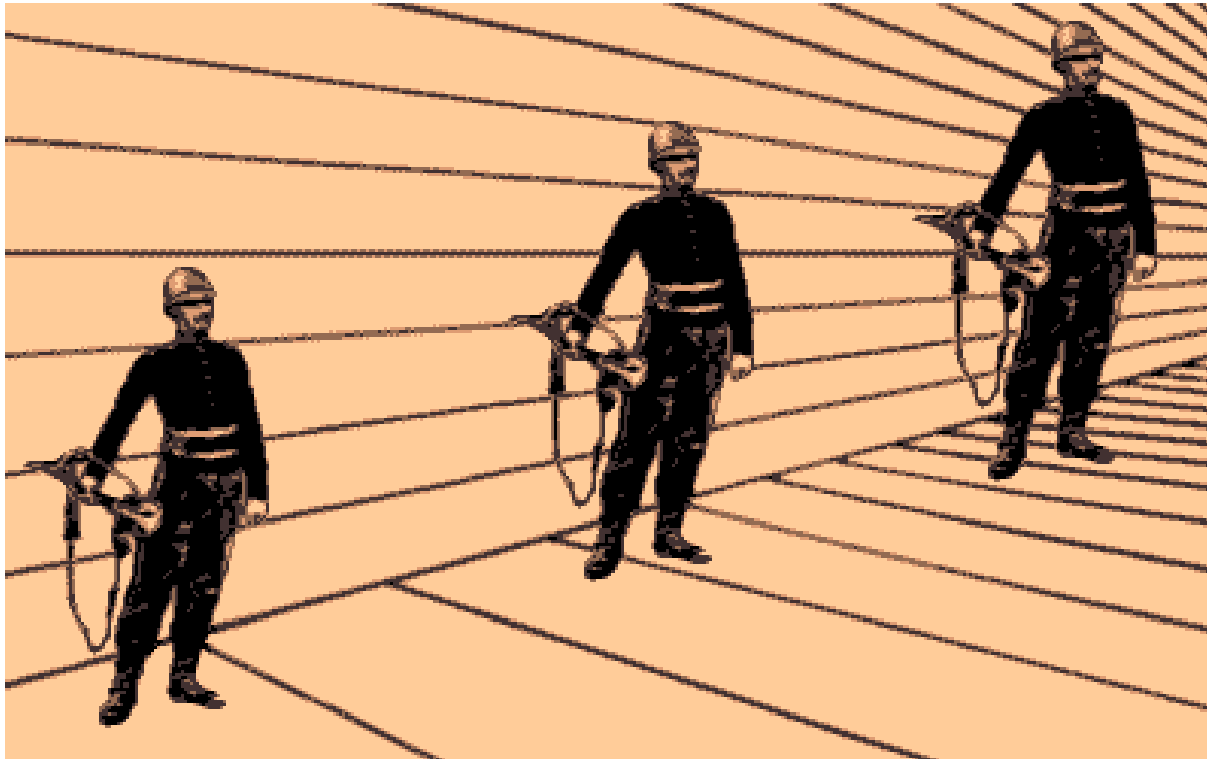


There are only 3 colors: White, green, and pink.
There seem to be two different shades of pink,
but there is only one pink.





Which Soldier is tallest?





What Attracts Attention

1. Motion

2. Color

3. Size



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

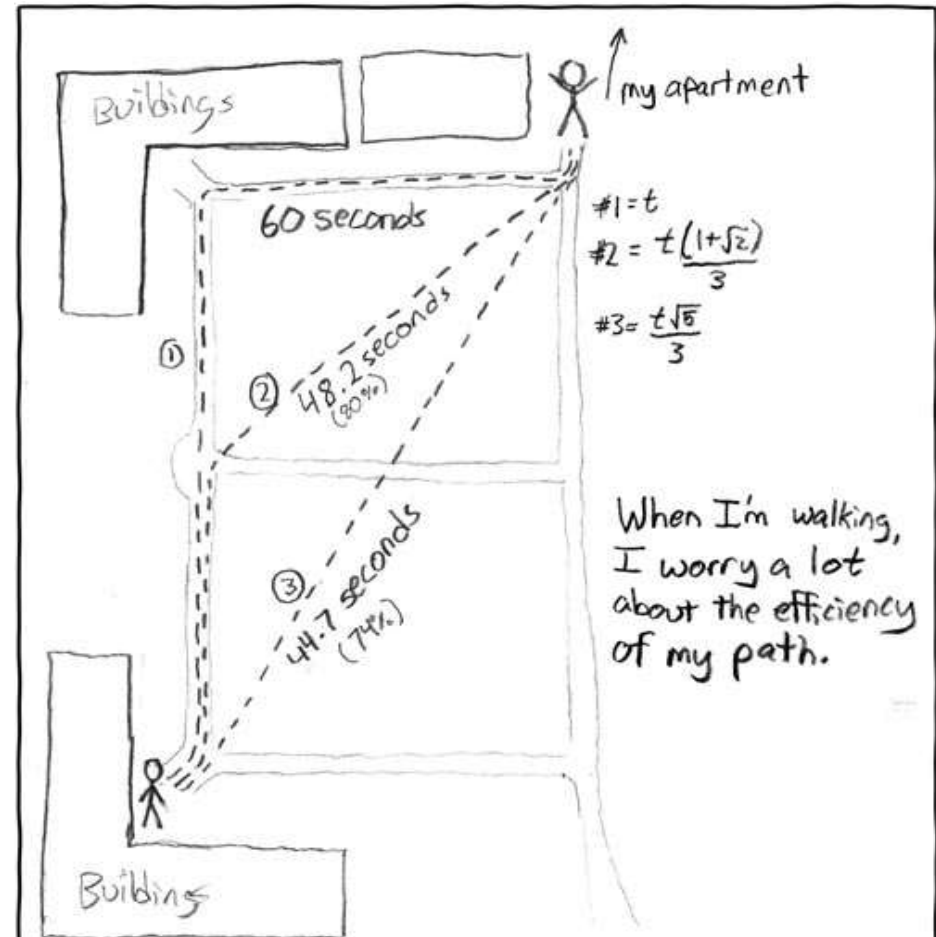
Main Uses of BI Reports & Dashboards

Exploration



xkcd.com

Explanation





Strong Foundations

- It's much easier to misuse BI tools than to use them well.
- Do a few things well and build from there.
- Think through your BI visualizations
(don't automatically assume that default settings are fine.)



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.



Vlami's 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.

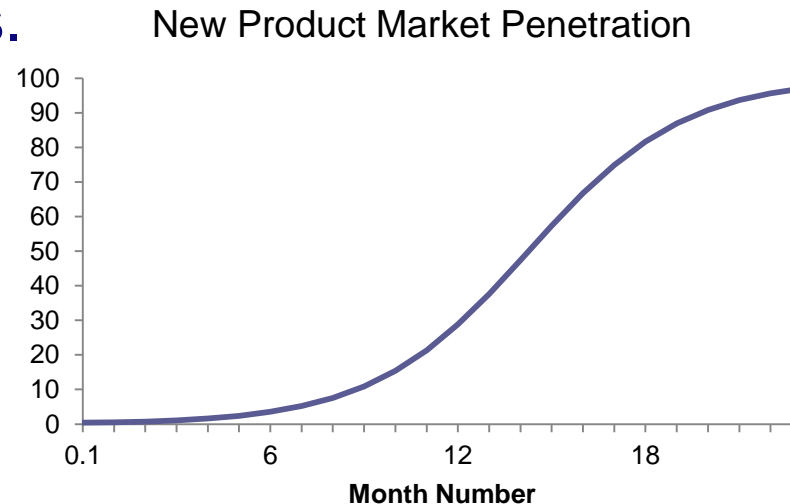


**Communication is about
perception,
not reality.**



Graphs and Tables

- Graphs and Charts depict visual representations and relationships.



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

District	Month	Dollars	WB Forecast Dollars	% Forecast
ATLANTA DISTRICT	03/01/2008	595,232.0	535,185.0	111.2
BOSTON DISTRICT	03/01/2008	1,882,036.0	1,954,736.7	96.3
CHARLOTTE DISTRICT	03/01/2008	215,360.0	204,592.0	105.3
CHICAGO DISTRICT	03/01/2008	1,381,552.0	1,236,574.0	111.7
CINCINNATI DISTRICT	03/01/2008	827,162.0	742,869.0	111.3
DALLAS DISTRICT	03/01/2008	1,060,316.0	897,654.0	118.1
DENVER DISTRICT	03/01/2008	955,876.0	1,050,735.4	91.0
DETROIT DISTRICT	03/01/2008	961,026.0	1,249,333.8	76.9
JACKSONVILLE DISTRICT	03/01/2008	1,827,434.0	1,892,779.4	96.5



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

	PERIOD	WIDGETS TO GADGETS RATIO CALCULATED USING CHECK LEVEL DETAIL					
		ELECTROMECHANICAL			PNEUMATIC		
		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 Ratio

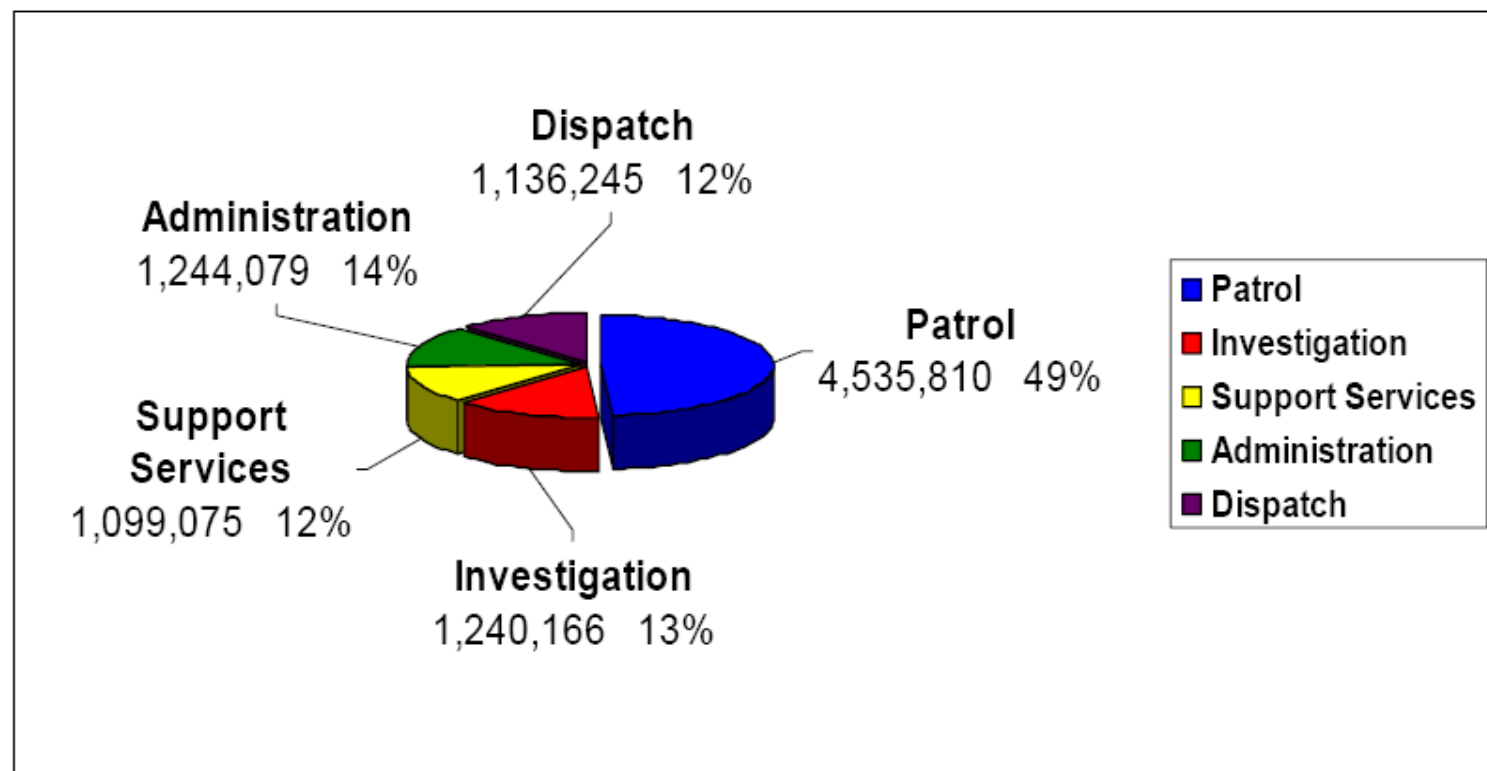
Period	Electromechanical			Pneumatic		
	In-store	Website	Distributor	In-store	Website	Distributor
1	22%	11%	83%	51%	21%	40%
2	21%	15%	81%	74%	21%	32%
3	22%	13%	82%	48%	22%	23%
4	21%	13%	82%	58%	31%	30%
5	22%	13%	81%	52%	19%	28%
6	25%	15%	80%	87%	15%	22%
7	26%	15%	79%	51%	23%	20%
8	27%	13%	80%	44%	22%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

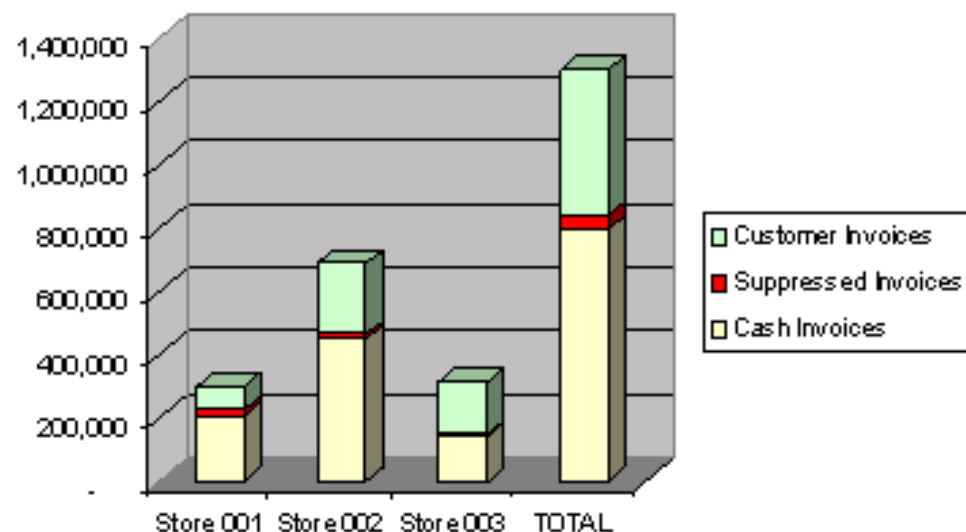
Ratios calculated using check level detail.

Periods include Jan - Oct 2007

2004 - 2005 Budget

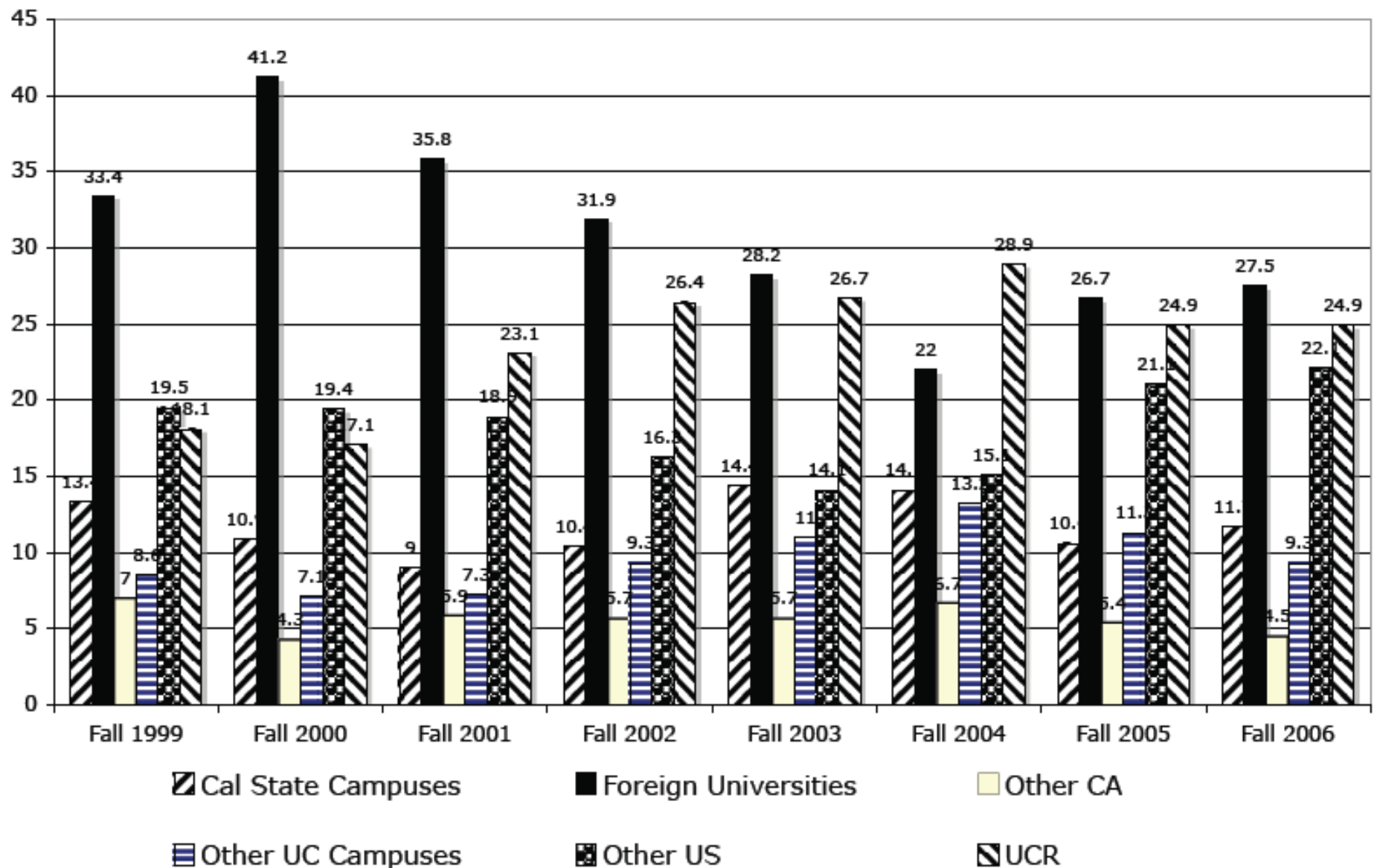
Budget By Division



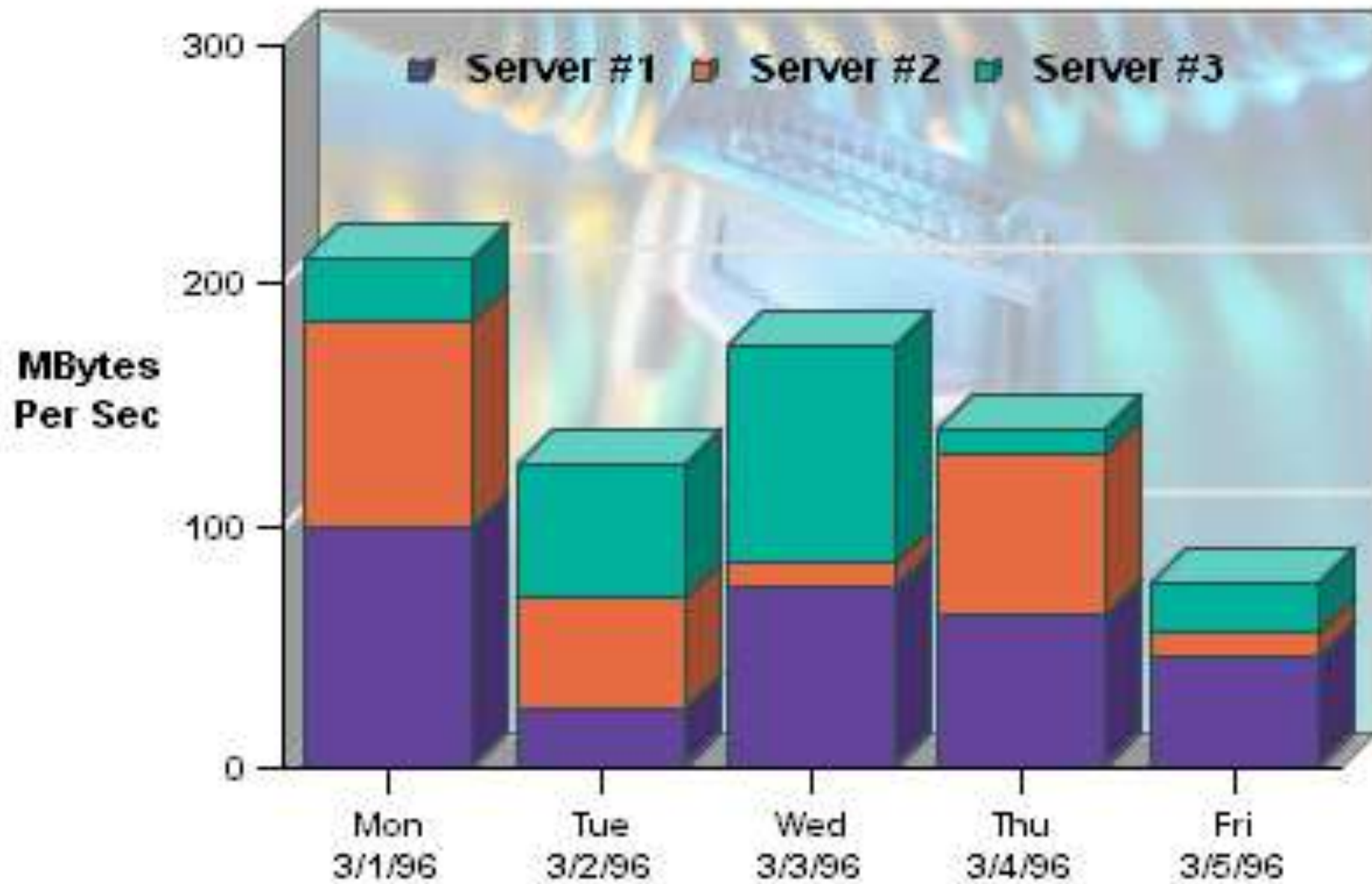


	Store 001	Store 002	Store 003	TOTAL
Total Invoices	298,943	687,091	313,140	1,299,174
<i>less</i>				
Cash Invoices	207,256	449,064	141,305	797,625
<i>leaves</i>				
Non-cash Invoices	91,687	238,027	171,835	501,549
<i>consisting of</i>				
Suppressed Invoices	18,888	15,527	6,501	40,916
<i>and</i>				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

Baccalaureate Degree Institutions of New Graduate Students- Fall Quarters- Percentages from Type of Institution



Weekday Server Load



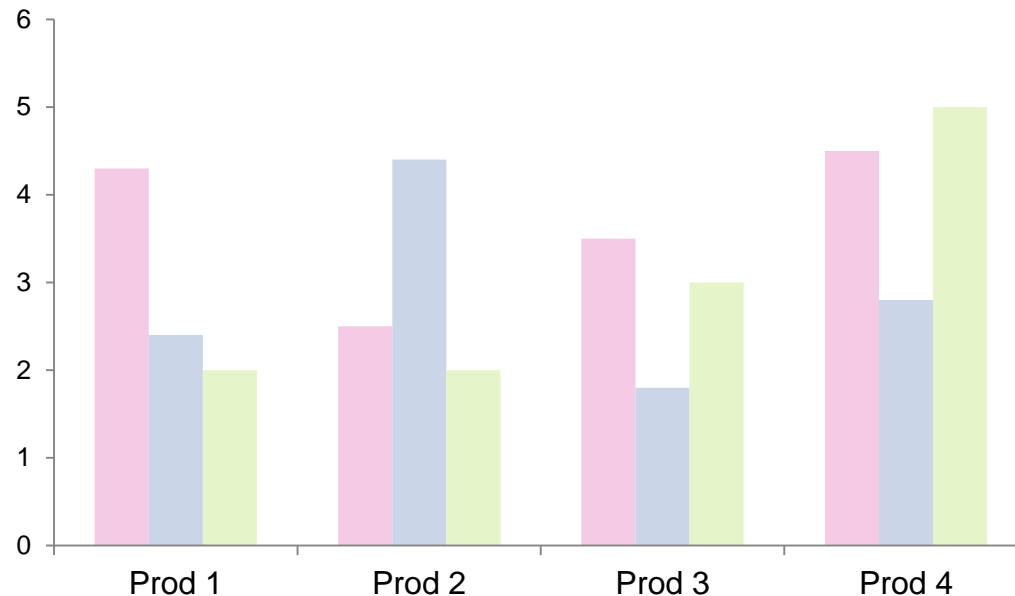


"With great power comes great responsibility."

Uncle Ben to Peter Parker, Spiderman 2002



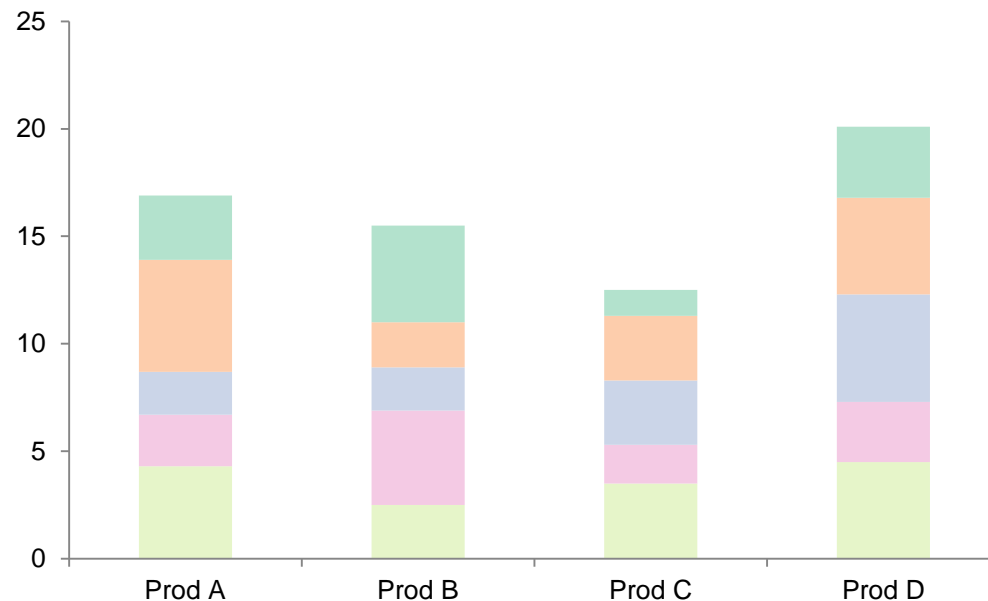
Bar Charts



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



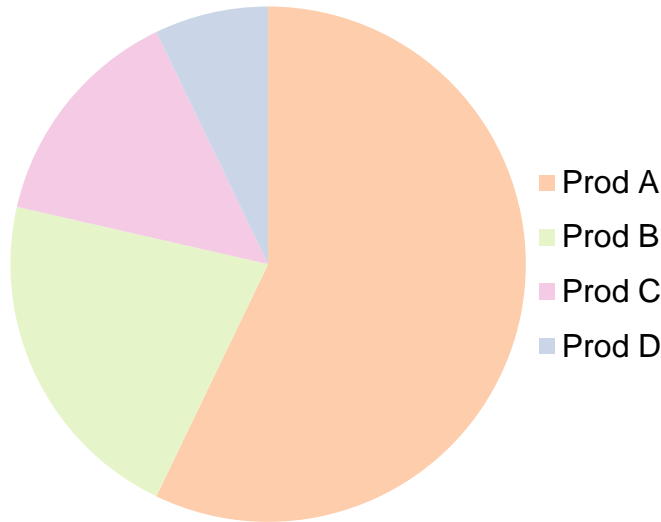
Stacked Bar Chart



- 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.



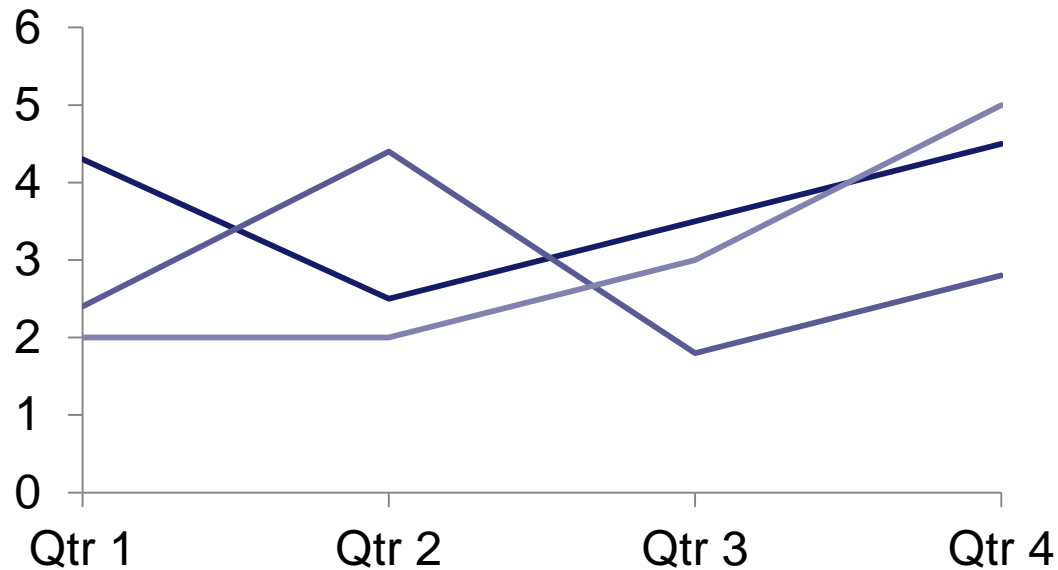
Pie Charts



- 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.



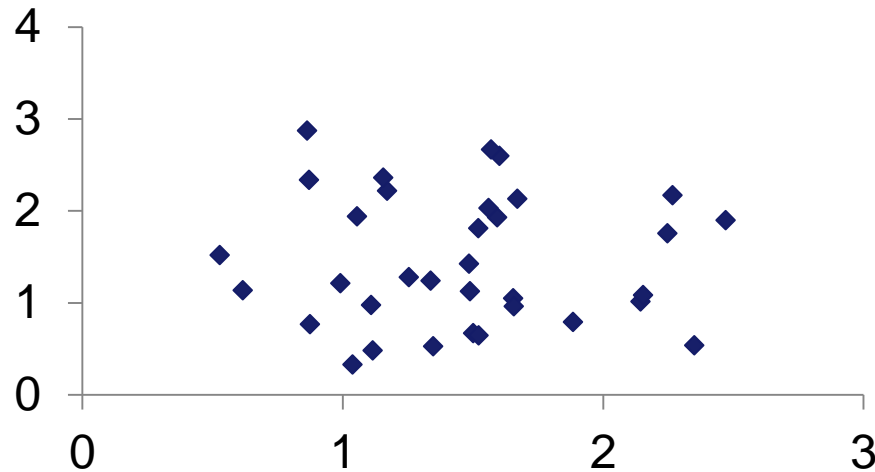
Line Chart



- 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.



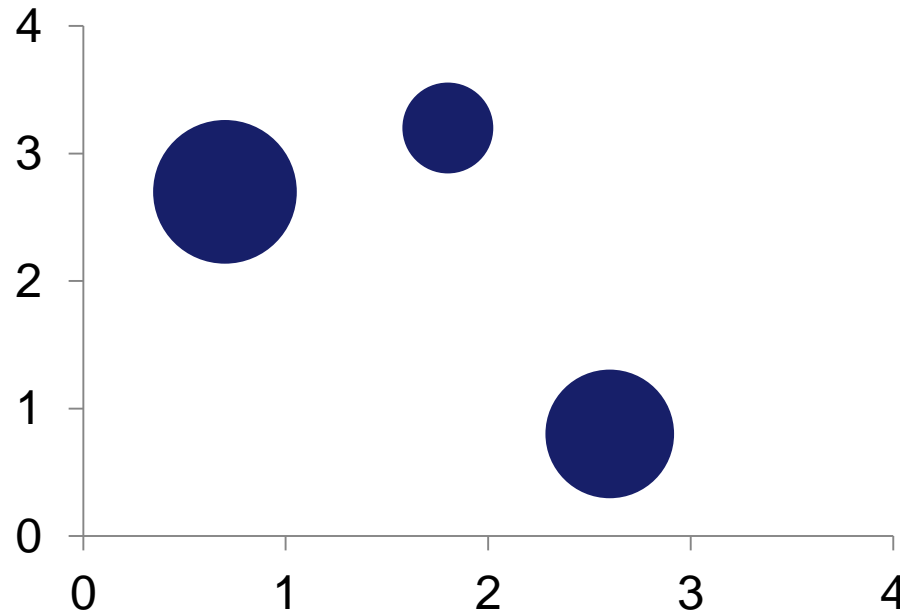
Scatter Plot



- Shows single data points at the intersection of two values.
- Often depict a large number of discrete data points (hundreds or thousands).
- Useful 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.



Using Color Effectively

- Consciously choose a color palate.
- ColorBrewer2.org
 - Sequential schemes 
 - Designed for ordered data that progresses from low to high.
 - Divergent schemes 
 - Place equal emphasis on mid-range values and extremes at both ends of the data range.
 - Qualitative schemes 
 - Used for nominal and categorical data where magnitude differences between classes should not be emphasized.



OBIEE 11g Changes in Ad-hoc

- Improved support for OLAP-style reporting
 - Hierarchical columns
 - Support for ragged and skip-level hierarchies
 - Dynamic re-arrangement of pivot tables in the dashboard
- Dynamic grouping and custom aggregates
- New Prompts
- New dashboard controls
- New gauge types and graphics

The screenshot displays the Oracle Business Intelligence (OBIEE) 11g interface. The main window is titled "Product Time Revenue w/Prompt" and shows a dashboard with a "Compound Layout" containing a "Pivot Table" and a "Static Text" block. The "Pivot Table" displays revenue data for various product categories, with a total revenue of 17,500,000. The "Static Text" block contains a prompt: "Keep Only the Selected Members <determined via Prompt Selections>." and a link to "Add to Briefing Book".

Products Hierarchy	Total Time Revenue
BizTech	21,000,000
Communication	10,885,416
Electronics	10,114,584
Accessories	2,698,715
Audio	7,415,869
SoundX Nano 4Gb	2,476,985
MicroPod 60Gb	4,938,884
FunPod	17,500,000



Hierarchical Columns

- Now supports expanding and compressing hierarchy in same column
- Just like other OLAP tools like Discoverer
- Supports ragged and skip level hierarchies
- Integrated with new grouping and custom aggregate capabilities
- Works with ANY datasource (OLAP, Relational, XML)

	Revenue
	⊕ Total Time
[-] Total Products	50,000,000
[-] BizTech	21,000,000
⊕ Communication	10,885,416
⊕ Electronics	10,114,584
[-] FunPod	17,500,000
⊕ Digital	7,735,105
⊕ Games	9,764,895
[-] HomeView	11,500,000
⊕ Services	1,005,845
⊕ TV	10,494,155
[-] Hot Products	18,822,801
⊕ Cell Phones	5,917,903
[-] Camera	7,735,105
MPEG4 Camcorder	3,995,040
7 Megapixel Digital Camera	3,740,065
⊕ Plasma	5,169,794



New Dashboard Prompts and Visualizations

- Available Prompts has been expanded
- Check List, radio buttons, list box, slider etc
- Step Based Prompt builder
- Master Detail links





MapViewer Integration

- Map is a new View Type!
- Integrates with spatial encoded and non-spatial encoded datasets
- Comes with NAVTEQ maps (State, County, Global)

Oracle BI Mobile

- Built on OBIEE Foundation
- Employs an embedded Dashboard approach
 - Supports Analyses, Dashboards, Publisher Reports, Action Framework, Scorecards, Alerts, Catalog Search
- Zero training to interact with data on mobile devices
- Gestural interactions, Orientation recognition, and Layout optimizations for tablet and smartphone platforms
- Technical
 - Will be Available from Apple iTunes App Store
 - Devices supported: iPhone 3GS, 4, iPad
 - Hybrid Application
 - Employs Webkit layout engine
 - Wrapped in a native iOS native shell
 - OBIEE Security Model (SSL and SSO)



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Authenticating With Server Configuration Setting
Sample App Server



Cancel














Oracle Business Intelligence Mobile



Catalog

/Shared Folders

-  0. Overview >
-  1. Quick Demos >
-  2. Functional Examples >
-  3. Analysis and Dashboards >
-  4. Actionable Intelligence >
-  5. Performance Management >
-  6. Published Reporting >
-  7. Server Features >
-  8. Source Specific Features >
-  Components >
-  sampleappwip >



Favorites



Alerts



Catalog



Search



Settings

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Revenue By Region.xdo

Revenue grouped by Year, Region

500 Oracle Parkway
Redwood Shores, CA 94065
USA

Report

ue

98 is 37,439,010.00.

COATINGS

uct category COATINGS is 37,439,010.00.

brand Enterprise is 7,798,224.00.

District	Revenue (USD)
YOUNGSTOWN DISTRICT	7,798,224.00
Total	7,798,224.00

brand Magicolor is 9,592,812.00.

District	Revenue (USD)
BOSTON DISTRICT	4,375,600.00
KANSAS CITY DISTRICT	2,671,080.00
PHILADELPHIA DISTRICT	2,546,132.00

Catalog

/Shared Folders/6. Published Reporting/Executive

Data Models

Quarterly Income Statement.xdo

Revenue By Region.xdo

Sales Dashboard with News.xdo

Sales Dashboard.xdo

Eastern Region

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Eastern Region

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1.1 Simple Demo Dashboard Geo Prompter

Settings

Mobile Layout ☐ OFF

Console Logging ☐ OFF

Documentation

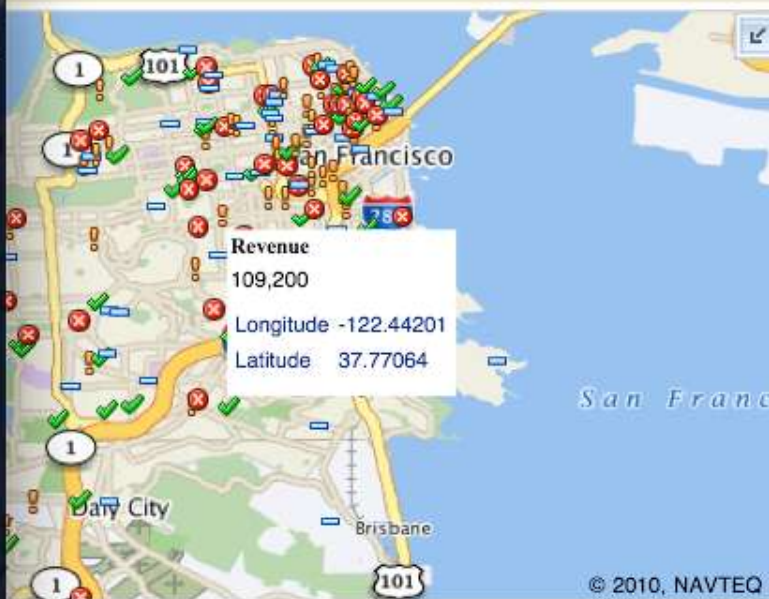
Sample App Server

Demo Server

Add Server

Version 11.1.1.4.0 (20110201.1)

Favorites Alerts Catalog Search Settings



Map Formats

View

Longitude, Latitude

☒ Revenue (Variable Marker)

Top Quartile

Second Quartile

Third Quartile

Fourth Quartile

	Orders	Revenue	Unit Price
bez	1	3,240	9.643
may	1	2,781	16.957
	1	336	1.059
ntile	1	336	2.288
kins	1	1,726	5.136
	1	2,781	21.227
pling	1	2,781	12.818
er	1	1,720	5.119
y	1	1,891	5.629
nan	1	2,781	6.685
	10	20,373	7.446





Master Detail Events Linking

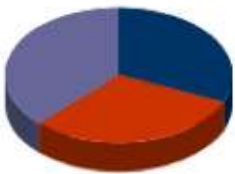


Master Detail Events Linking

Time run: 2/2/2011 1:46:00 AM

Quarter	Revenue	Paid Amount
2008 Q1	2,707,686	737,035
2008 Q2	8,109,716	5,113,334
2008 Q3	4,338,844	7,780,625
2008 Q4	1,343,754	2,223,477
Grand Total	16,500,000	15,854,471

Revenue



Revenue

Revenue, Paid Amount



Quarter 2008 Q4

Genmind Corp

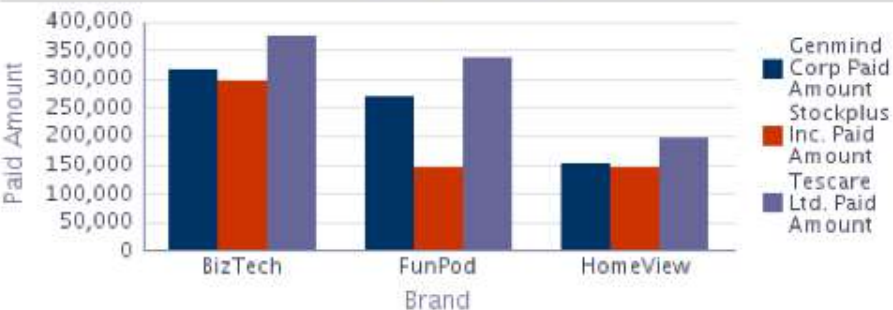
	Revenue	Paid Amount
Brand		
BizTech	175,158	313,817
FunPod	167,150	267,976
HomeView	80,809	152,449
Grand Total	423,117	734,242

Stockplus Inc.

	Revenue	Paid Amount
Brand		
BizTech	210,983	293,981

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Paid Amount





Quarterly Income Statement.xdo

Standard Template

ORACLE

Currency: USD

Date:27-NOV-2006 22:48:33
Page:1

Select

Done

Quarterly Income Statement

Standard Template

Press Release

	Same Qu Ending Nov-06			Year-to-Date Ending Nov-06
Revenue				
Hardware Revenue	1			73,614,532
Support Revenue	2			3,695,656
Consulting Revenue	1			4,383,441
Training	933,410	616,764	14,484,276	2,524,239
Miscellaneous	4,965,662	733,326	12,654,743	2,393,843
Total Revenue	46,633,996	27,382,507	116,402,886	86,611,710
COGS	<31,035>	13,288,452	215,932	31,405,193
Salaries	0	28,000	303,207	167,834
Benefits	0	0	196	148
Commissions	37	1,427,8	106,720	422,998
T&E	446,685	50,227	1,084,779	237,973
Other Operating Expenses				
Computers & IT	6,300,829	678,137	17,603,448	3,524,327
Advertising & PR	9,585,124	276,426	24,357,589	1,074,334
Facilities	5,582,063	688,198	14,292,099	3,028,289
Professional/Recruiting Fees	1,206,825	220,063	3,187,062	845,748
Shipping & Transportation	5,976,174	1,313,874	14,945,138	4,284,443
Miscellaneous	1,008,403	141,668	2,977,198	608,409
Total Expenses	30,075,105	16,799,323	79,069,369	45,599,696

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Today 1:21 PM



BI Implementation Success

- BI systems provide value when they are used.
- Proper visualizations encourage usage.
- Poor visualizations mislead and frustrate and ultimately lead to misuse, mistrust, or abandonment of the BI system.
- BI implementations typically require tremendous time and money, but also offer the potential for huge ROIs.
- Most executives lack training in visualizing data and analysis and are unlikely to do it properly by chance.
- “Finish the project” with a small percentage of resource stretched over the first year of the system’s use.



Summary

- Don't use defaults.
- Use color very sparingly.
- Favor pastels. (Check out ColorBrewer.com)
- Don't use 3-D graphs.
- Eliminate gridlines.
- Eliminate other non-data ink as much as possible.
- Use the appropriate graph or table style.
- Determine if users are exploring or explaining.
- Finish the project. Don't stop at installation.



Questions and Observations

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