PLEASE FILL OUT YOUR EVALUATIONS

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BYOD Workshop for Oracle Analytics

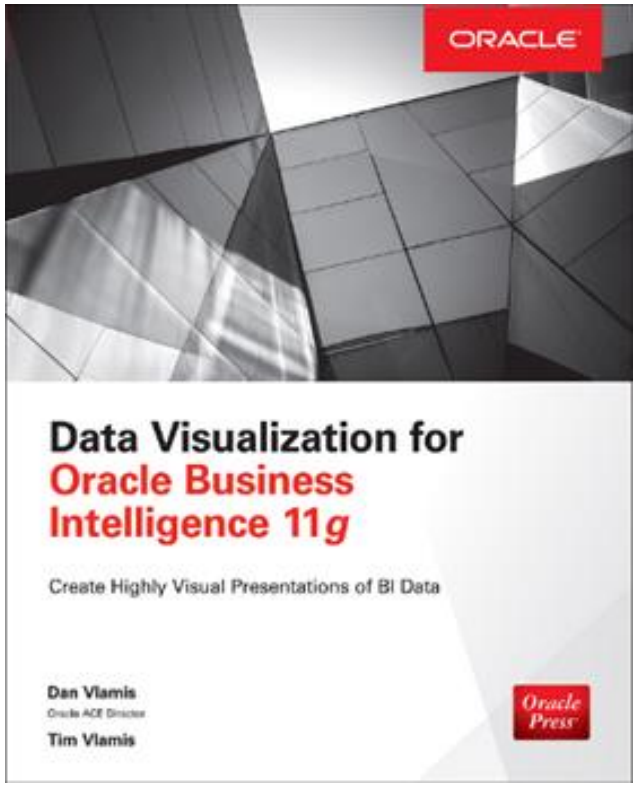
Tim Vlamis and Mike Caskey

June 22, 2021

www.vlamis.com

Vlamis Software Solutions

- Founded in 1992 in Kansas City, Missouri
- 400+ Enterprise Clients
- Consults in :
  - Enterprise Business Intelligence & Analytics
  - Analytic Warehousing
  - Machine Learning and Predictive Analytics
  - Data Visualization
  - ETL and data integration
- Vlamis consultants average 15+ years
- www.vlamis.com (blog, papers, newsletters, services)
- Co-authors of book "Data Visualization for OBI 11g"



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Data is common, logic is rare

"Crime is common. Logic is rare. Therefore it is upon the logic rather than upon the crime that you should dwell."

Sir Arthur Conan Doyle
The Adventure of the Copper Beeches

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- This workshop is about how to develop effective data visualization projects, not about features and functions.

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BYOD – Flat file data set (excel preferred)

- Column names in row 1
- Do not repeat column names
- No inter-row summaries, formatting, etc.
- About 20-30 columns (at least 10)
- At least one fact
- At least two attribute dimensions
  - Example: If sales is the fact, customer and product would be two dimenions.
- At least one date column
- 1000-10,000 rows (don’t need huge amounts of data)

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Consider the topic of your data set

- What is your data set about?
- What is the most important fact?
- What are the significant dimensions? (think Who, what, where, etc.)
- What are the shapes of the distributions for your columns?

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Determine your topic

- Create a tile for the upper left hand corner
- Determine three most important dimensions.
- Choose a time “grain”. (monthly, weekly, annual, etc)

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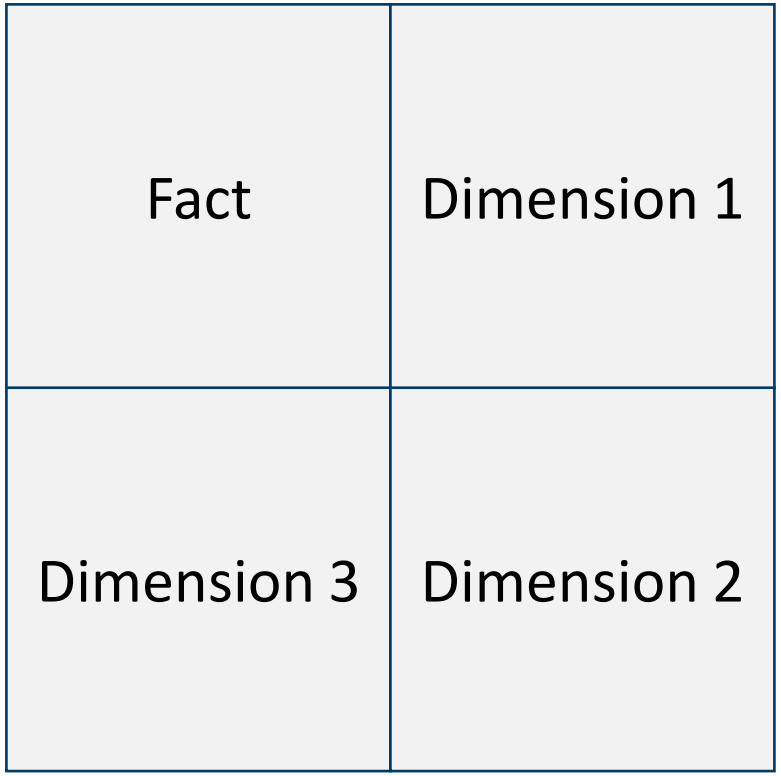
Keys to Data Discovery

- Identify your main topic of interest with a performance tile
- Summary
- Evaluating a fact or a dimension?
  - Sales analysis
  - Customer or product analysis
- Fact analysis
  - Find lowest grain
  - Flat low distribution
  - Event or transaction
- Look for clustered distribution
    - Scatter with points as event in fact table
      - Set fact on X axis and response variable on Y axis



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4 Quadrant Layout - Data Discovery

- Identify your main topic of interest with a performance tile
- Summary
- Evaluating a fact or a dimension?
  - Sales analysis
  - Customer or product analysis
- Fact analysis
  - Find lowest grain
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Building Out Canvases

- Name first canvas “Summary”
- Build a canvas for each major dimension
- Consider comparison visualizations
- Consider dual attribute visualizations (product size/color)
- Consider change visualizations (recency, frequency, magnitude)

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Consider other facts and derived measures

- Build scatter plots with major topic as Y axis (dependent variable) and other fact as X axis independent variable)
- Consider normalization techniques (average, %, Z score, etc)
- Consider simple derived facts (differencing, ratios, etc)

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Simple Pivot Table with Easy Questions

2014 Monthly Sales by Company

	2014 / 01	2014 / 02	2014 / 03	2014 / 04	2014 / 05	2014 / 06	2014 / 07	2014 / 08	2014 / 09	2014 / 10	2014 / 11	2014 / 12	Grand Total
D4 Company	Sales	Sales	Sales	Sales	Sales	Sales	Sales	Sales	Sales	Sales	Sales	Sales	
Genmind Corp	$202,019	$296,178	$393,254	$401,352	$621,749	$921,152	$823,760	$576,288	$590,033	$477,079	$324,569	$326,255	$5,953,688
Stockplus Inc.	$317,533	$475,312	$650,825	$605,253	$868,347	$1,272,701	$1,076,425	$904,047	$947,674	$788,834	$515,927	$531,188	$8,954,066
Tescare Ltd.	$261,837	$422,774	$555,255	$550,912	$844,094	$1,222,869	$1,012,856	$810,286	$814,160	$691,479	$447,950	$457,773	$8,092,246
Grand Total	$781,389	$1,194,264	$1,599,334	$1,557,516	$2,334,190	$3,416,722	$2,913,041	$2,290,621	$2,351,868	$1,957,392	$1,288,446	$1,315,216	$23,000,000

- What was the highest monthly sales for a company?
- Which month had the largest drop in sales for a company?
- In which month(s) did Tescare have a greater gain than Stockplus?
- Is there a seasonal pattern to sales for all companies?

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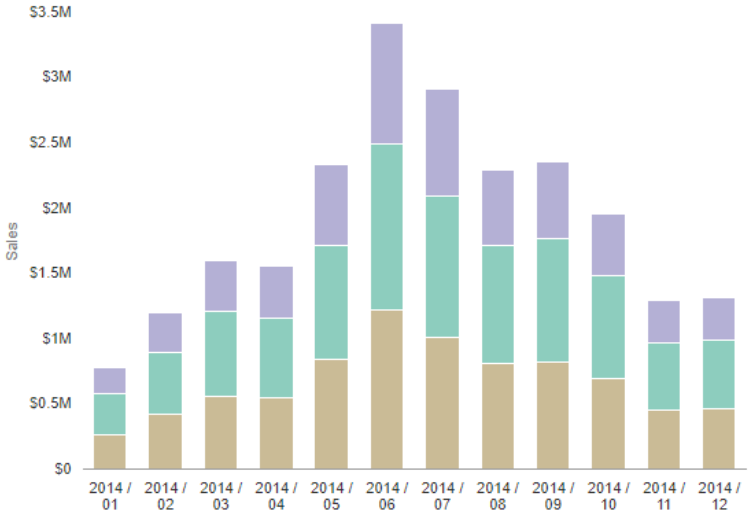
Answers are Easy to Find in Graphs

Total Sales 2014

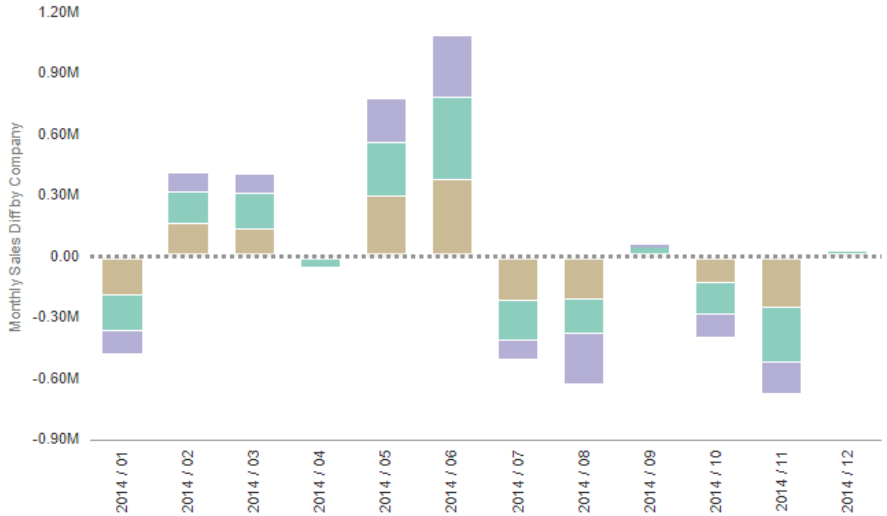
$23,000,000

Genmind Corp	Stockplus Inc.	Tescare Ltd.
$5,953,688	$8,954,066	$8,092,246
2014 Sales	2014 Sales	2014 Sales

2014 Monthly Sales by Company



Difference from Previous Month Sales by Company



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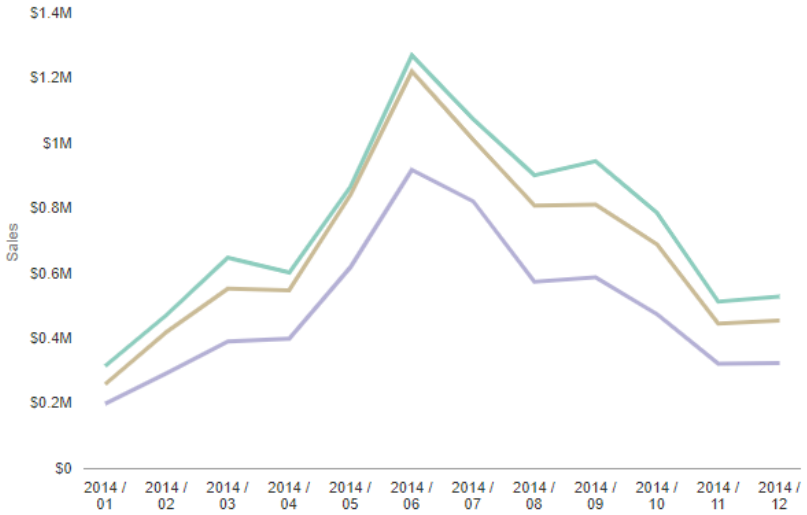

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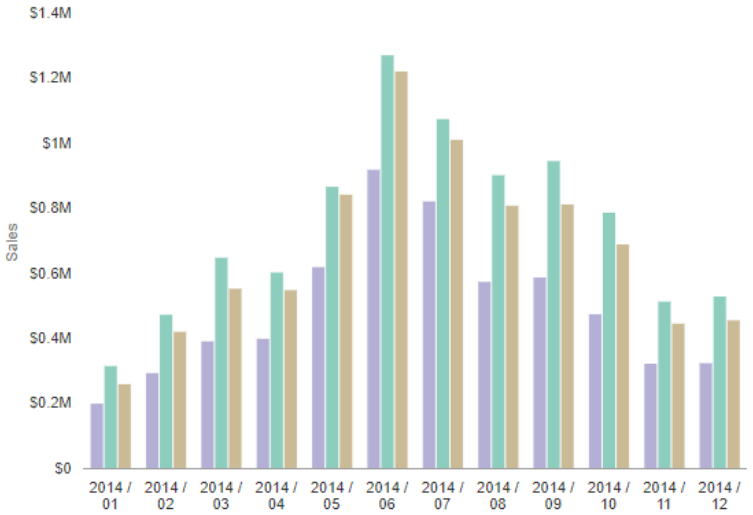

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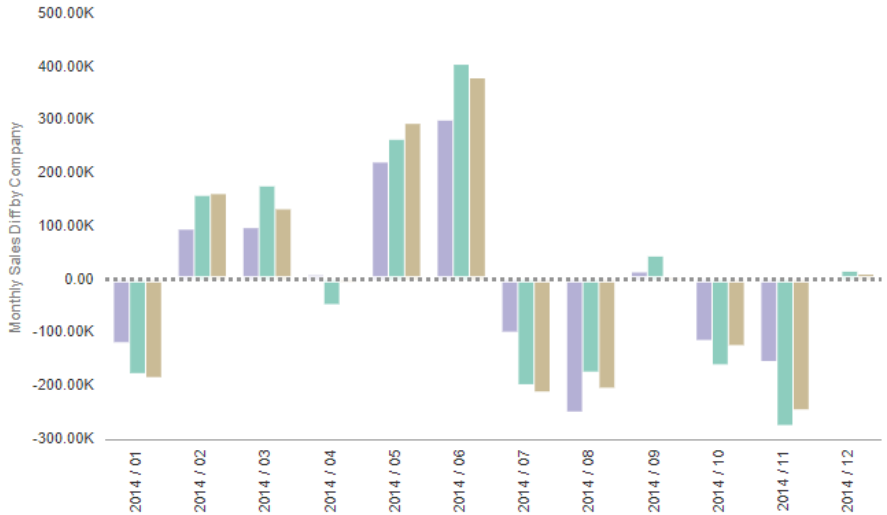

What was the highest monthly sales for a company?

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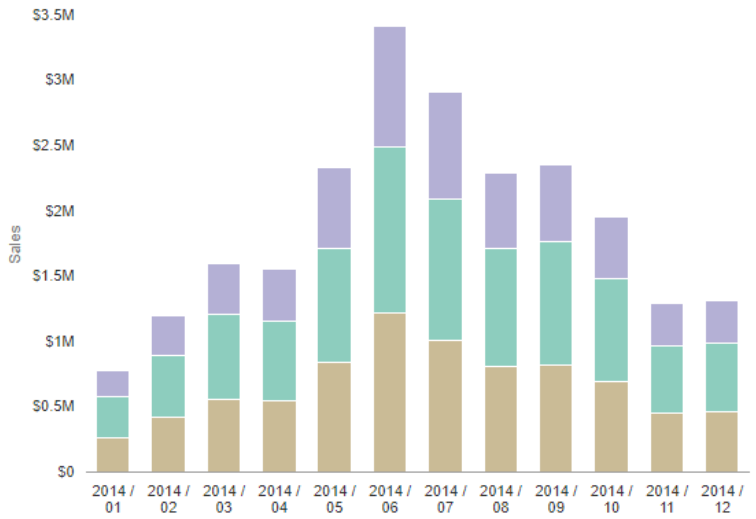

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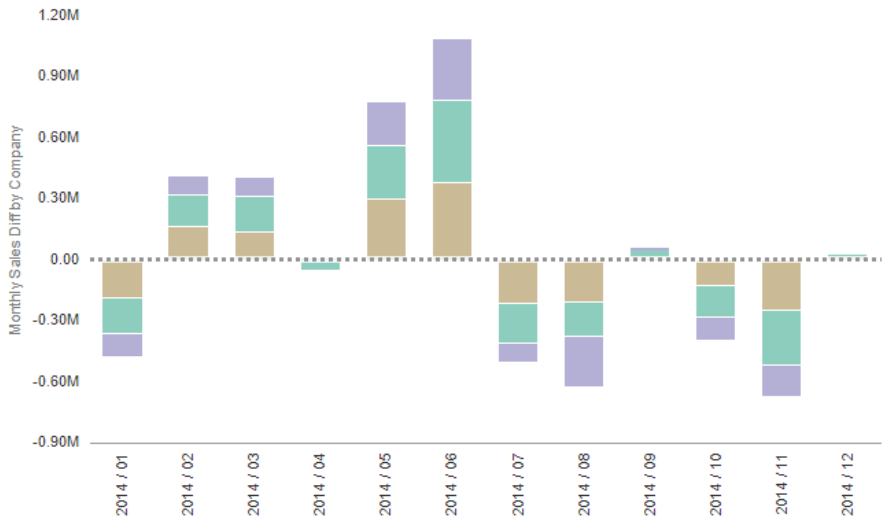

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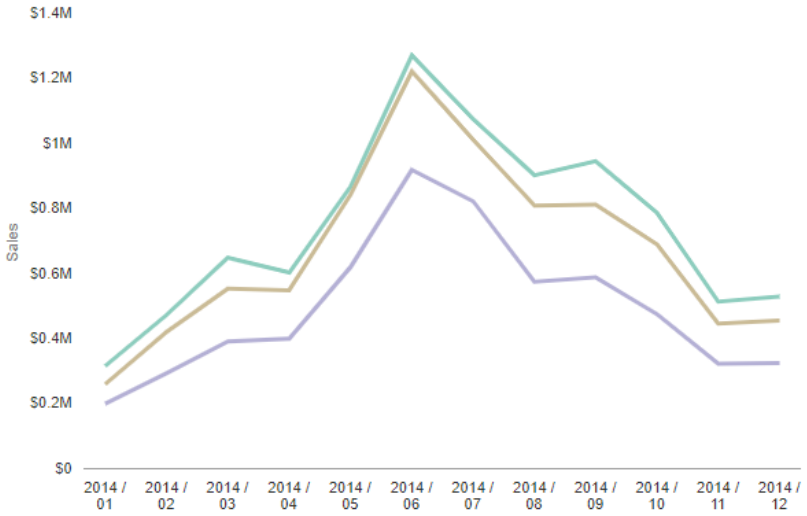

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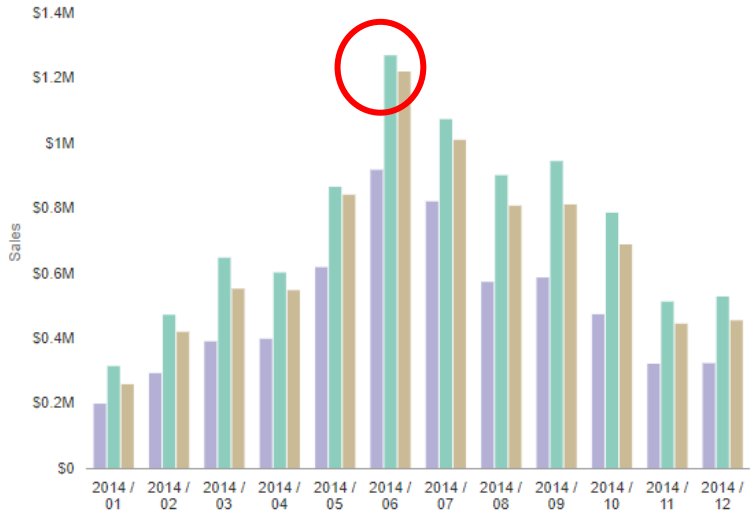

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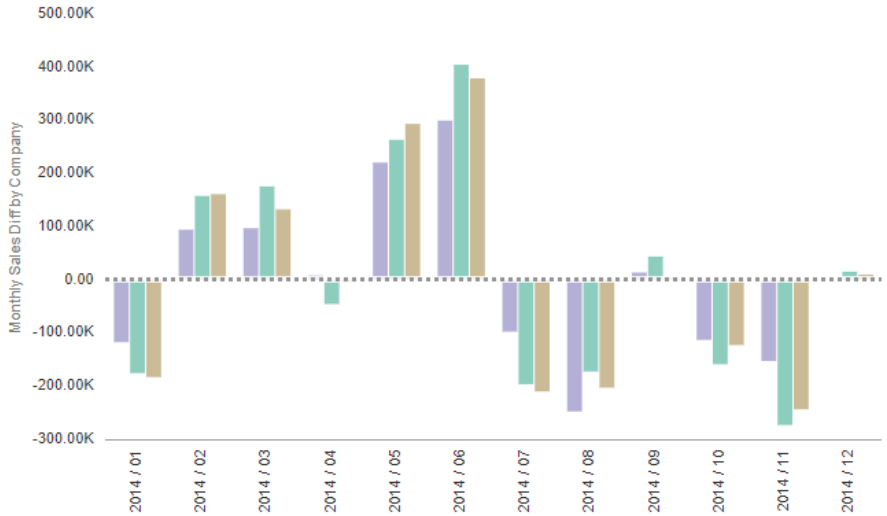

Which month had the largest drop in sales for a company?

Total Sales 2014

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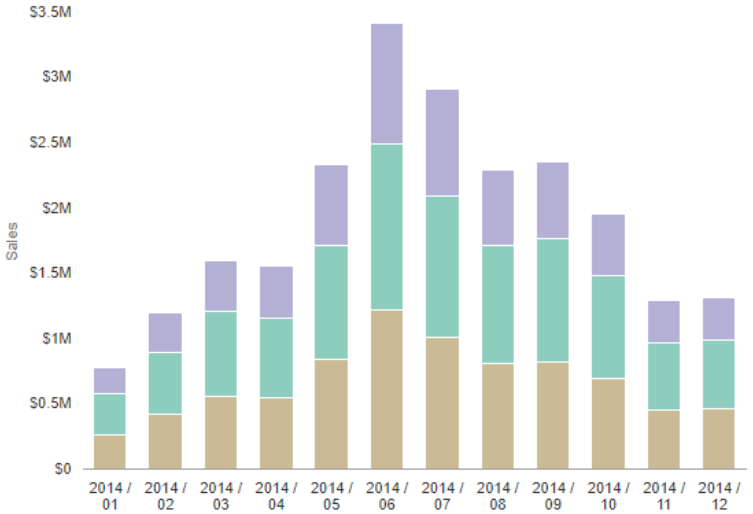
2014 Sales	2014 Sales	2014 Sales

2014 Monthly Sales by Company



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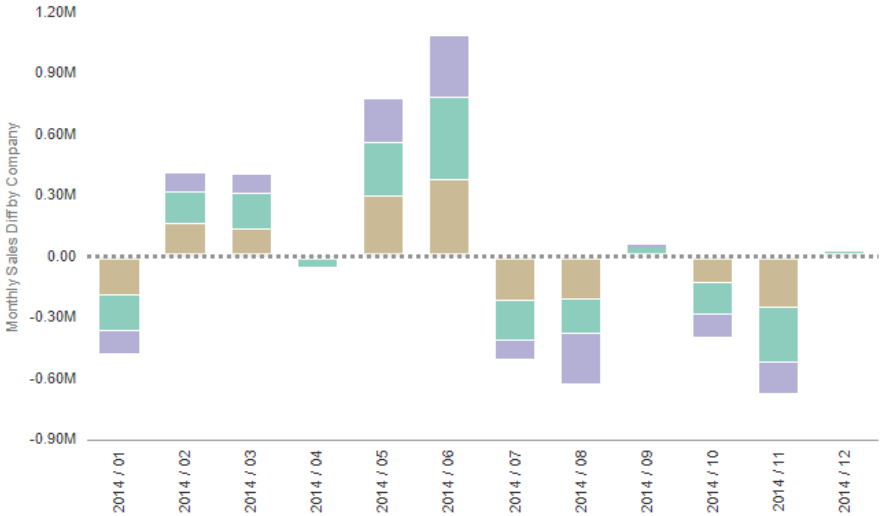

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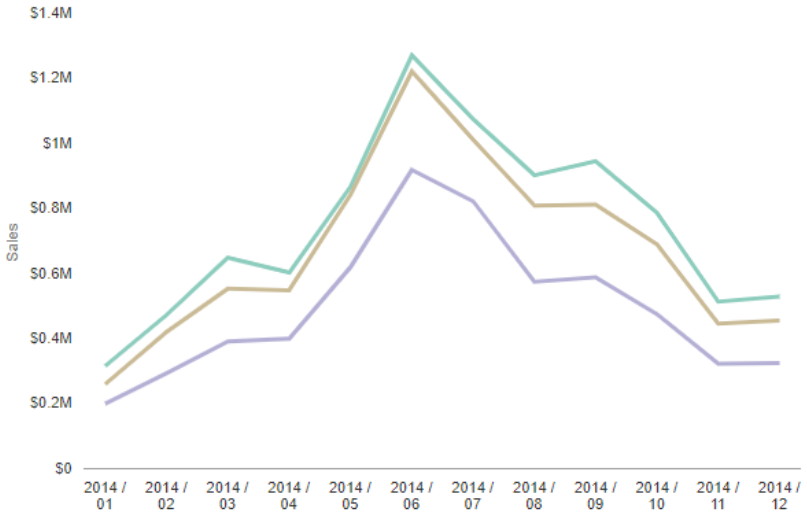

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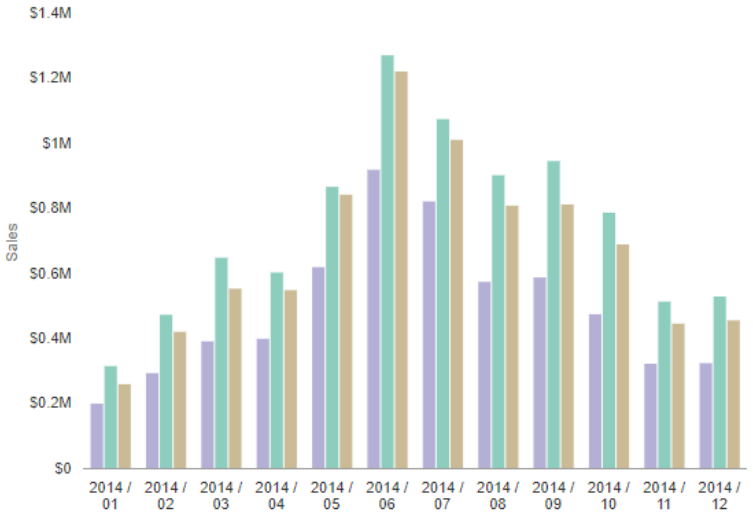

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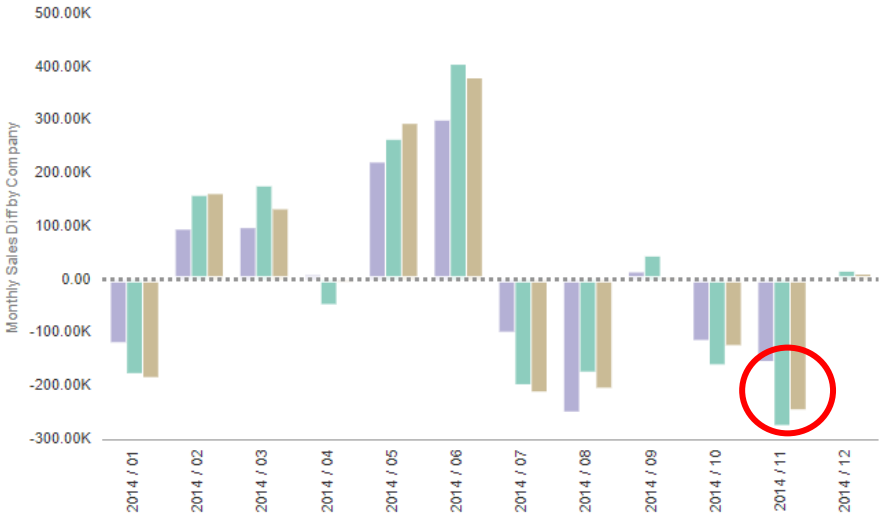

In which month(s) did Tescare have a greater gain than Stockplus?

Total Sales 2014

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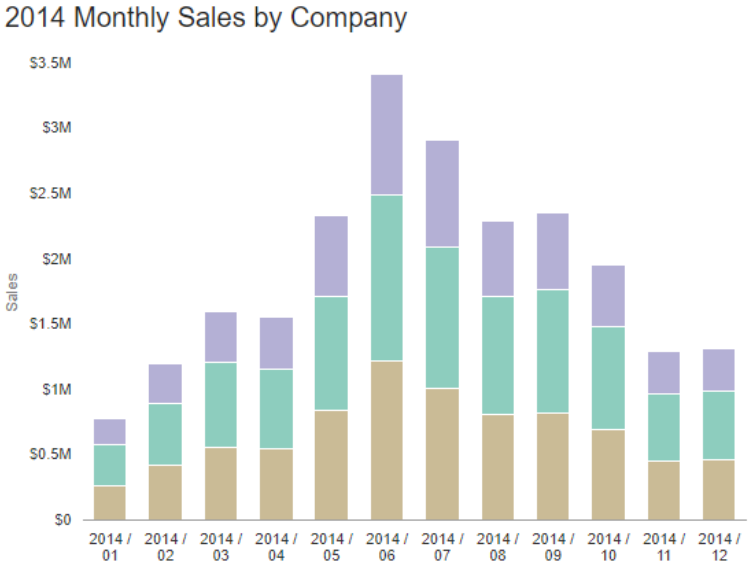

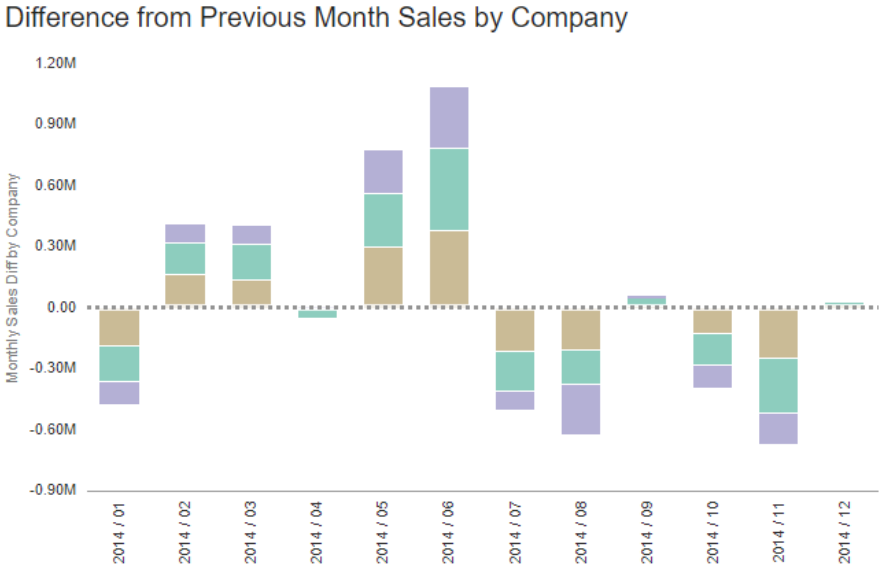

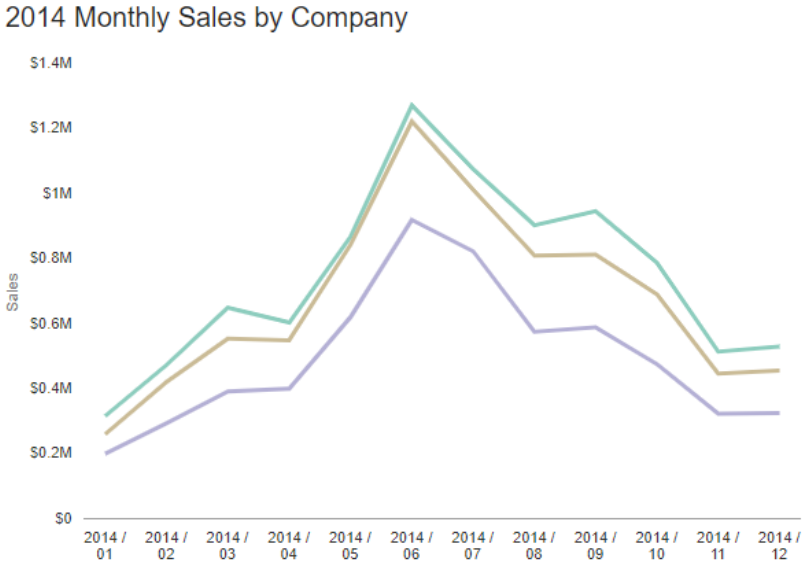

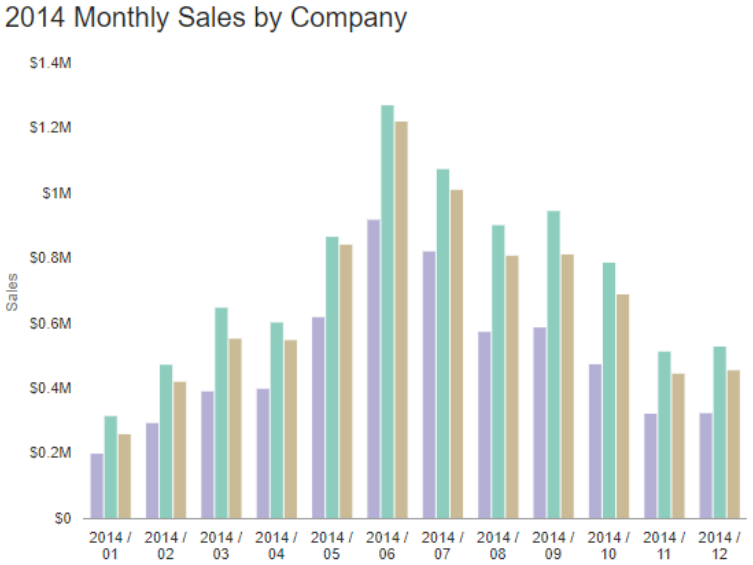

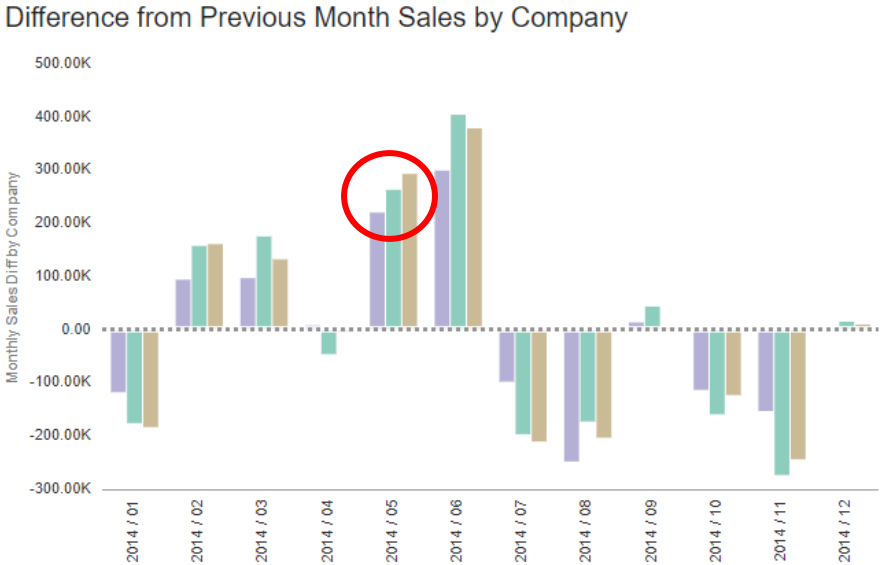

Is there a seasonal pattern to sales for all companies?

Total Sales 2014

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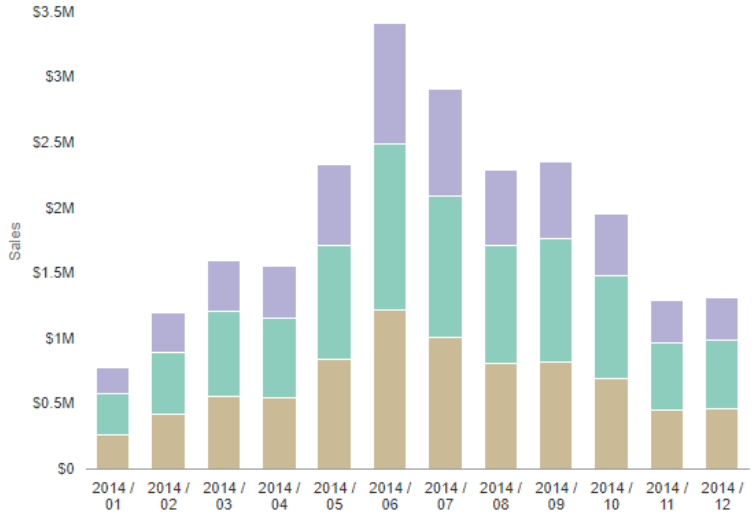

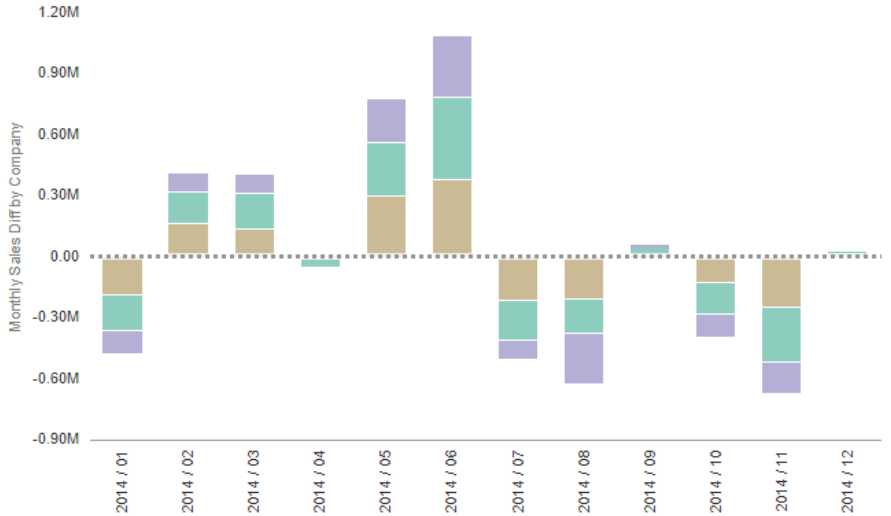

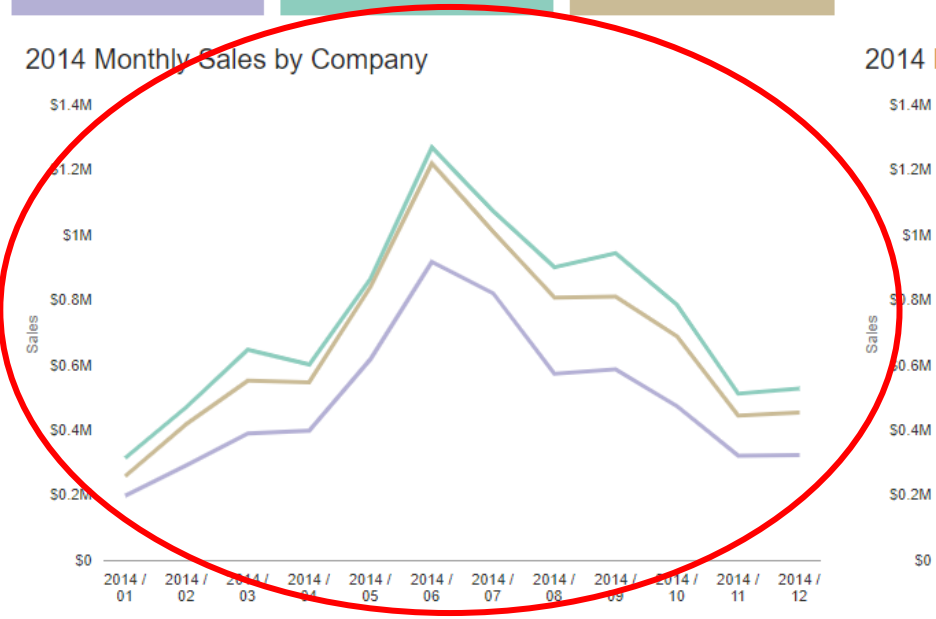

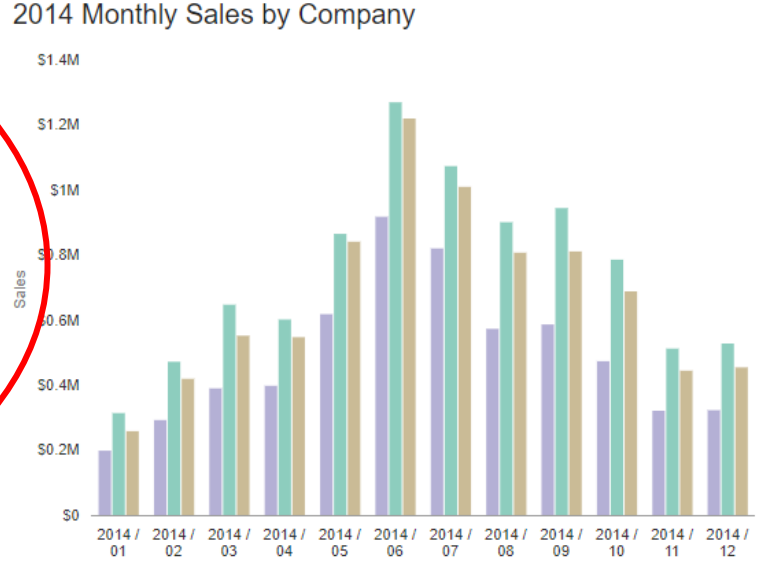

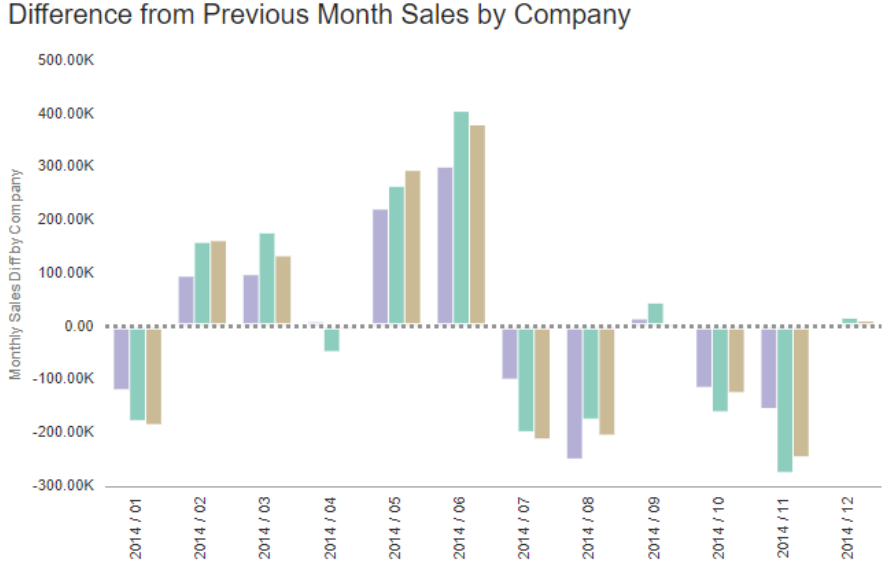

It’s OK to Repeat Data in Multiple Views

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Layout

- Four Quadrant layout
- Summary KPI layout
- Multi-dimension layout
- Driving graph layout

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Key Questions to Ask About Dashboards

- Who is the audience?
- What is the subject or topic?
- What is the major insight?
  - What element has the most visual weight?
  - What element has the most prominent position?
- What context is provided and what comparisons are made?
- What are the decision scope and the data scope?
- Are navigation options understood?
- Are prompts and selectors understood?
- Are dashboard pages ordered logically?

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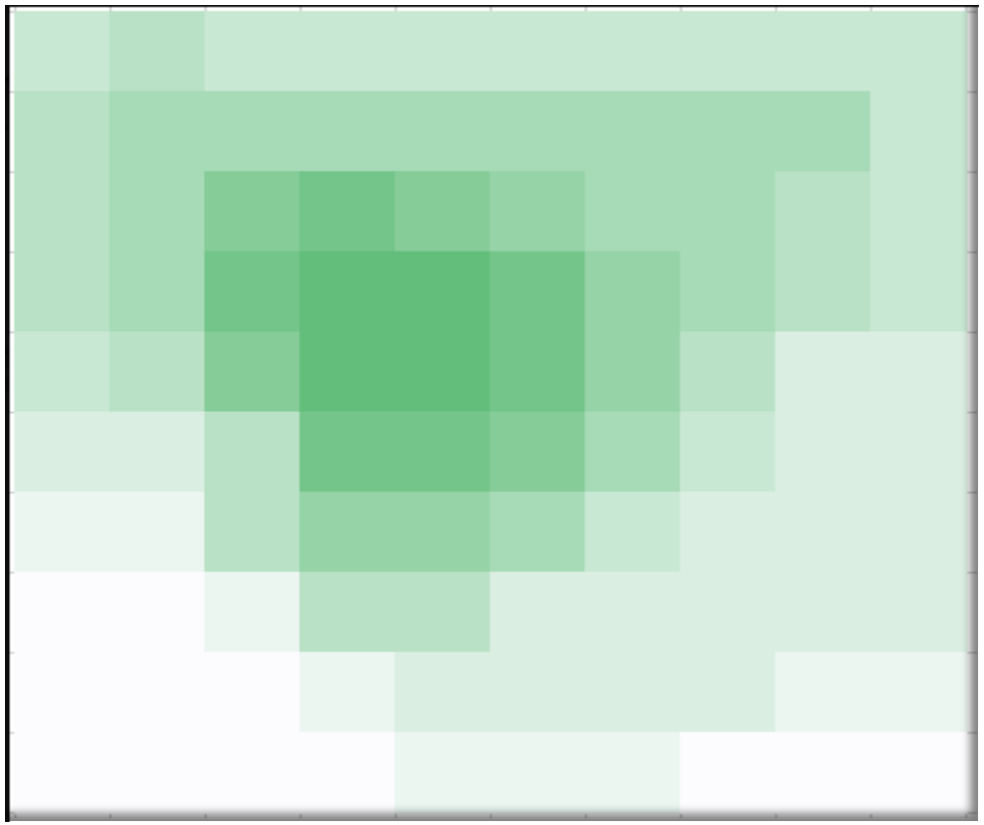
Dashboard Layout Strategies

- Center and Top are most visible.
- Place prompts and navigation links in a consistent location.
  - Leftmost column is best for prompts
  - Navigation can be less prominent
- More important info gets more visual weight and better location.
- Place detailed look up information at the bottom of dashboards.
- Alignment
- Proximity



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BI Dashboards

- Role-based.
- Data selection and filtering are extremely important.
- Dashboards support evidenced-based decision making.
- Shared understanding of business situation is a key benefit.
- Content may be individualized.
- Design should be standardized.

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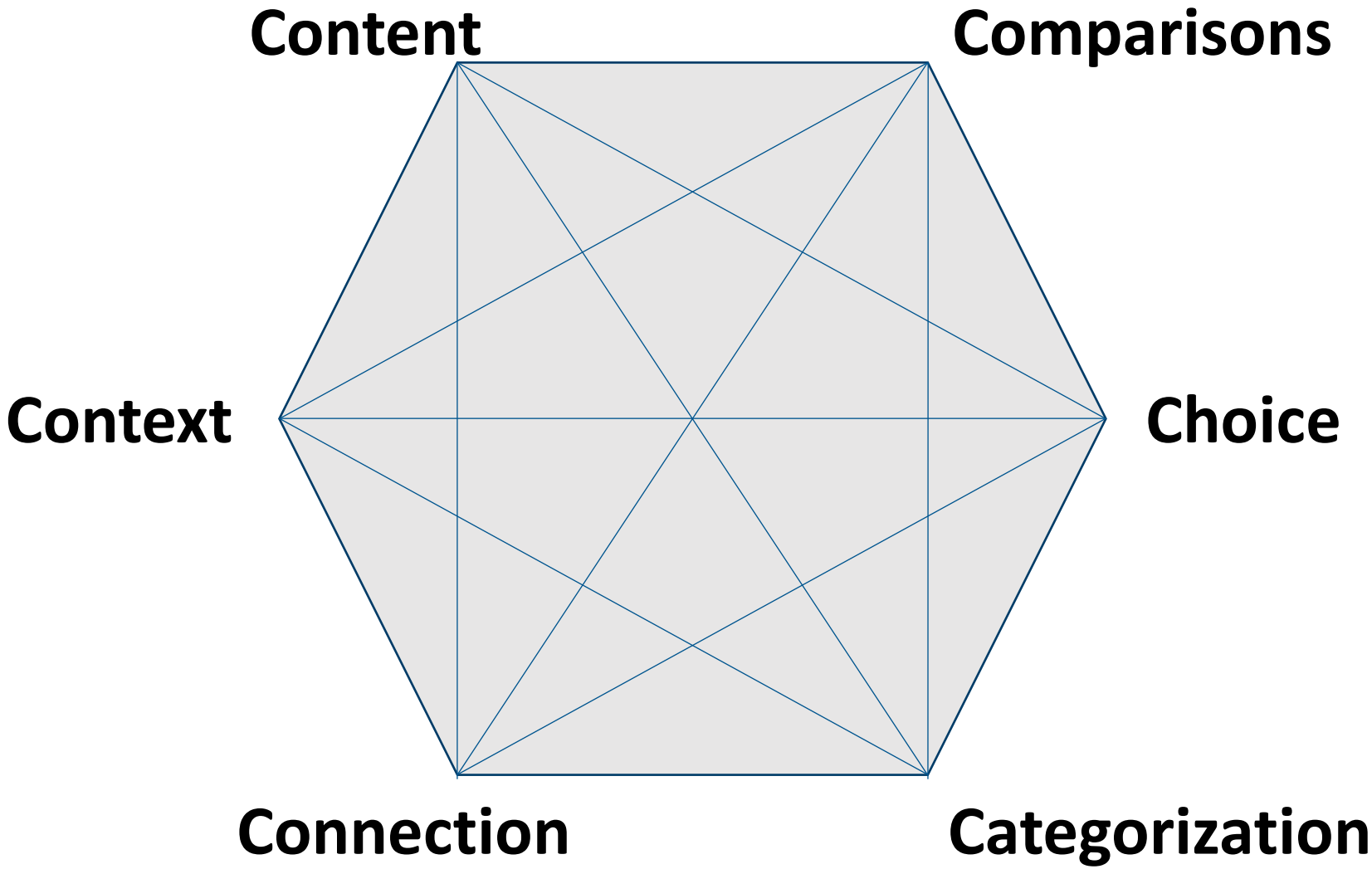
Great Dashboards Balance 6 Requirements



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Great Dashboards Balance:

- Content (what's displayed)
- Comparisons (relative importance)
- Choice (user-invoked changes to the display like prompts)
- Connectivity (navigation, drill-to-detail, cross-drills, linked displays)
- Context (how displayed, i.e. design)
- Categorization (how organized and logically collected)

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2 Major Facts 1 Major Dimension

- Use scatter plot
  - Placement of data is ordered.
  - Use multiple scatter plot graphs to reveal insights when working with more than two facts.
  - Only add grid lines with meaning (quadrants)
- Consider using box plot for large data sets with large number of data points and several attributes.

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Summary 4 Quadrant Layout

- Evaluating a fact or a dimension?
  - Sales analysis
  - Customer or product analysis
- Identify your main topic of interest with a performance tile
- Summary view of three key dimensions for fact topics
- Summary view of dimension measures and key comparison for dimensions
  - Versus last period/forecast/budget
  - Top N (magnitude, change, %, new)
  - RFM (recency, frequency, magnitude)

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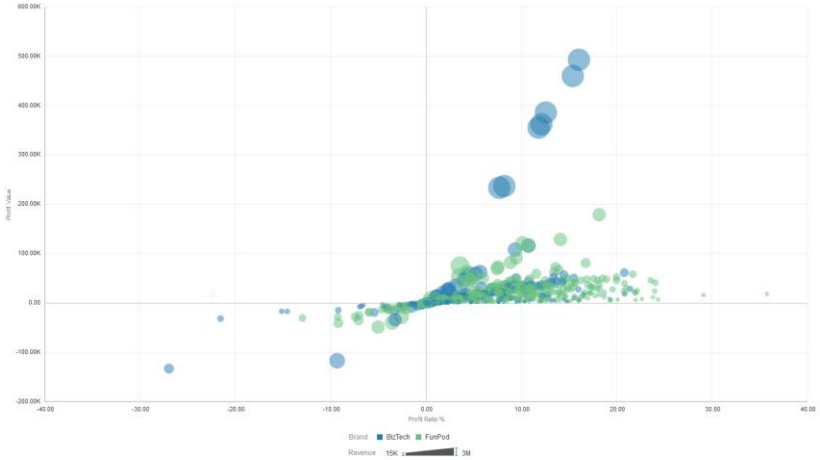
Dimensional Analysis

- Order of importance for Scatter Plots
  1. Y Axis typically has the "response variable", i.e. highest interest
  2. X axis has the "independent variable".
  3. Color (can be categorical or numeric)
  4. Size
  5. Trellis by category
  6. Shape
  7. Filters



- Use logarithmic scale for "long tail" distributions or break into two or more graphs.

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Dimensional Analysis

- Use brushing and selection with multiple graph layouts.
  - Build four or five graphs with related attributes or measures.
  - Too many graphs or several highly dense graphs exceed limitations
- Consider alternative graph types
  - Scatter plots
  - Trellis charts
  - Sankey graphs
  - Parallel coordinates
  - Grid heat maps

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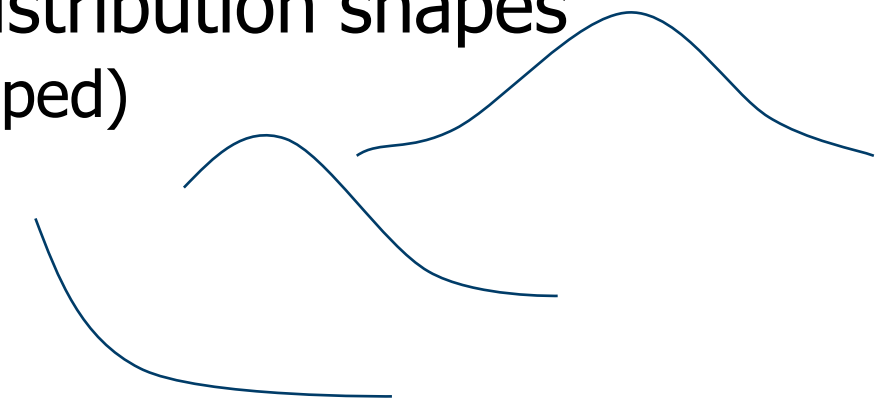
Understanding Measures for Exploration

- Aggregation method is important
- If use average, also add a bucketed measure
- Compute differences
- Understand data's natural distribution shapes
  - Normal distributions (bell shaped)
  - Log-normal distributions
  - Exponential distributions



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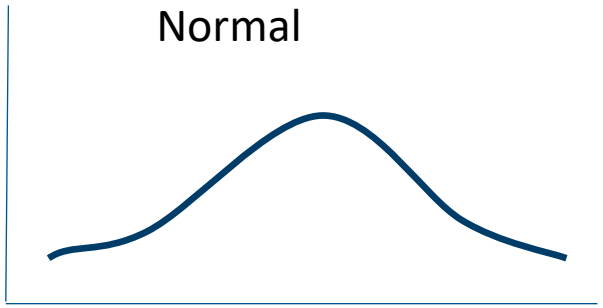
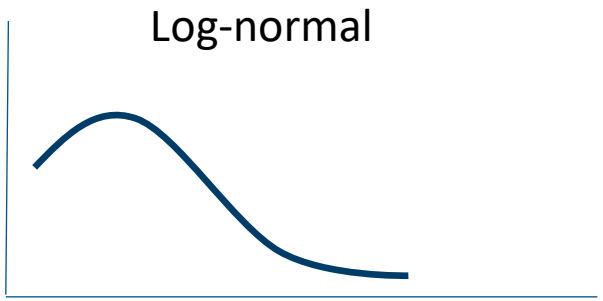
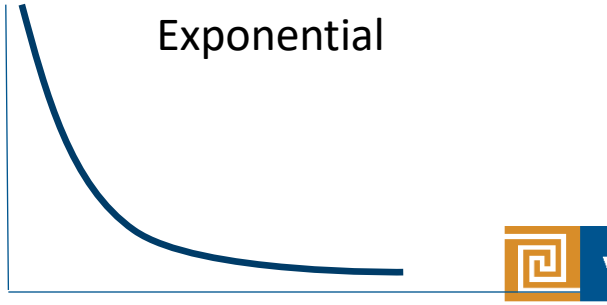
Understanding Measures for Exploration

- Understand data's natural distribution shapes
  - Normal distributions (bell shaped)
  - Log-normal distributions
  - Exponential distributions
- Average has strong meaning only for normal distributions
- Outlier identification & treatment are important for non-normal distributions







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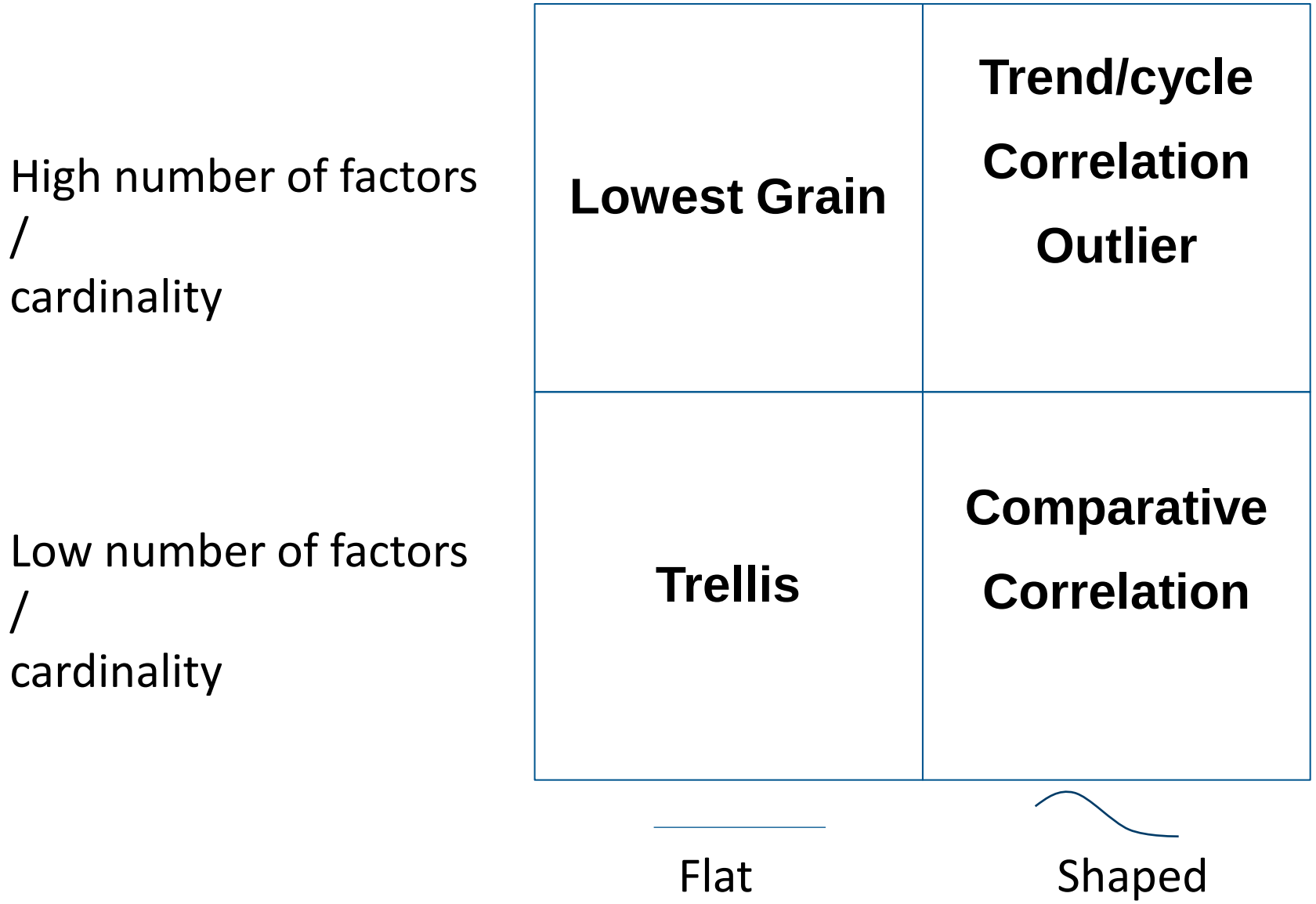
Dimensional Columns



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Visual Discovery and Analytic Techniques

- Graph distributions of data
- Seek outliers
- Graph differences directly
- Normalize data to facilitate comparisons
- Bin or Bucket data to facilitate insights
- Use high density graphs to uncover potentially meaningful attributes
- Choose a meaningful sort order for every visualization
- Determine the importance of different measures and attributes and place them in the appropriate place for every visualization.

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Progression of Data Explanations

1. True exploration (new data set, unknown insights)
2. Ad hoc discovery (known data set, seeking new insights)
3. Guided navigation
4. Selections and reading
5. Summary dashboard
6. Narration and storytelling

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Keys to Effective Data Story Telling

- Have a main idea or key point every visualization/layout
- Give your key point the most visual weight
- Provide supporting context and data for your key point
- Address potential objections and justify choices/assumptions
- Summarize your main point

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Different Strategies

- If it’s worth doing, it’s worth doing right.

- The perfect is the enemy of the good.

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Questions?

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Thank You!!

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PLEASE FILL OUT YOUR EVALUATIONS

Resources

- ColorBrewer website. Color ramps. http://colorbrewer2.org/
- Iwanthue. color ramps and scripts for data scientists https://medialab.github.io/iwanthue/
- W3 Schools Color Picker. Adjust color intensity

https://www.w3schools.com/colors/colors_picker.asp

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