Charts, Graphs and Visualizations: Telling better data stories with your dossiers

Raghav Nyati
Product Management, MicroStrategy
1. What is data analytics?
2. 4 phases of data viz
3. The data you have
4. Before you begin
5. 5 ways to tell your story
6. Design tips
7. Good v. bad eggs
8. Resources
9. Q + A
What is data analytics?
### Why Data Viz Matters

Make hidden trends and patterns in your data visible

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Why Data Viz Matters

Communication and persuasion with numbers

Communicate

+

Persuade
4 phases of data visualizations
The Data Viz Quadrant

Understanding the 4 phases of data visualizations

Declarative

Conceptual

Exploratory

Data-driven

Source: HBR
The Data Viz Quadrant

How business roles fit into the quadrant

- **Declarative**
  - Consultants
  - Experts
  - VPs/Execs
  - Managers

- **Conceptual**
  - Consultants
  - Managers
  - Analysts
  - Data Scientists

- **Exploratory**

Source: HBR
The data you have
The Data in Your Possession

Understanding datasets enables analysis

Data Types

Qualitative (Attributes)
- Nominal Data
- Ordinal Data

Quantitative (Metrics)
- Cardinal Data
The Data in Your Possession

Qualitative Data Types - Attributes

Nominal Data (Attribute)

Data that be counted, not ordered or aggregated.

Examples

- **Product** – Books, Movies, Magazines
- **Gender** – Male, Female
- **City** – Los Angeles, Washington DC, New York City
The Data in Your Possession

Qualitative Data Types - Attributes

**Ordinal Data (Attribute)**

Data that can be counted and ordered, but not aggregated

**Examples**

- **Date** – 1/1/2015, 1/2/2015, 1/3/2015
- **Rank** – Like, Neutral, Dislike
- **Grade** – C, C+, B-, B, B+, A-, A, A+
The Data in Your Possession
Quantitative Data Types - Metrics

Cardinal Data (Metrics)

Data that can be counted, ordered, and aggregated.

Examples

- **KPIs** – Revenue, Cost, Profit
- **Counts** – Number of Employees, Number of Units
- **Measures** – Distance, Time, Temperature
Before you begin
Questions to Ask Yourself

Big Ideas

• What
• Who
• Why

Details – Variables and Distribution

• How many variables do you want to show?
• How many data points will you display for each variable?
• Will values shown be over a period of time, or among items or groups?
5 ways to tell your story
Presenting Your Data

5 Ways to Tell Your Story

1. Composition
2. Comparison
3. Relationship
4. Distribution
5. Exploration
Presenting Your Data

Composition (1/5)

Goals
• Part-to-whole relationship
• How total breaks down

Use Cases
• How has each account executive contributed to total sales this year?
• What are my unit sales like within this product line across each region?
• Where are people coming from before arriving on our website?

Suggested Visualizations
• Stacked bar chart (OTB)
• Stacked area chart (OTB)
• Pie chart (OTB)
• Heat Map (OTB)
• Waterfall (Plug-in)
• Bullet chart (Plug-in)

Tips
• Context clues are important to show b/c of relative values
• No more than 5 categories
• Use contrasting colors for immediate clarity
Get to Know the Data Viz

Composition

- Few Categories
  - Pie Chart: 1 Attribute, 1 Metric
  - Parts of the Whole
- Many Categories
  - Heat Map: 1+ Attributes, 1+ Metrics
- Parts of the Whole
  - 100% Stacked Bar: 2+ Attributes, 1 Metric
Presenting Your Data

Comparison (2/5)

Goals
• Magnitude
• Lowest v Highest
• Increasing v Decreasing

Use Cases
• Which product is the best-seller in this department?
• How do our sales this year compare to last year’s?

Suggested Visualizations
• Heat Map (OTB)
• Bar Chart (OTB)
• Line Chart (OTB)
• Mekko Chart (Plug-in)

Tips
• Use tables when comparing or showing precise values
• Use thresholds to color code distinct gaps and groups
• Limit comparisons to 3 variables
• Choose two colors in the same color family and a complementary one
Presenting Your Data

Comparisons – Detailed View

Few Categories

Few Items

Clustered Bar Chart

Many Categories

Bar Chart

Many Items

Bar Chart Matrix
Presenting Your Data

Distribution (3/5)

Goals
- Understand how values are distributed along an axis
- Consider data range, patterns, and outliers

Use Cases
- How much product has been sold and how does it correlate with revenue?
- How many packages did we ship out this week and what’s the cost per package across the product line?

Suggested Visualizations
- Bar chart (OTB)
- Line chart (OTB)
- Bubble chart (OTB)
- Maps (OTB)
- Box Plot (Plug-in)
- Sankey Diagram (Plug-in)

Tips
- Use solid lines.
- Use different graphing styles for different datasets.
- Vary colors for different datasets.
Presenting Your Data

Distribution – Geography & Maps

Distribution

Few Data Points

Many Data Points

Bubble Map

Area Map

Marker Map

Density Map
Presenting Your Data

Relationship (4/5)

Goals
• See if activity exists between variables
• When you suspect or guess that there are correlations, outliers, and clusters of data

Use Cases
• Does advertising spend influence sales outcomes?
• How many people download our app across regions?
• Where do we mostly import products from and what time of commodity?

Suggested Visualizations
• Scatterplot / Bubble chart (OTB)
• Network Graph (OTB)
• Sankey (Plug-in)
• Radar Chart (Plug-in)

Tips
• Make sure both axes are labeled.
• Be clear with units of measurement.
• Keep in mind which variables you’re relating because the scales can greatly affect appearance.
Presenting Your Data

Type of Analysis: Explorations (5/5)

Goals
• Break apart a dataset
• Get an idea of patterns or trends immediately

Use Cases
• What are customers most upset about?
• Which dates or months are popular for traveling?
• What’s the timeline of our product releases and how long have each been around?

Suggested Visualizations
• Network graph (OOTB)
• Timeline (Plug-in)
• Calendar (Plug-in)
• Word Cloud (Plug-in)
Design Tips
Design Considerations

Moment + Detail
Design Considerations

Moment + Detail
Leverage Desktop’s Flexibility

Quickly change your visualizations for rapid prototyping
Design Considerations

Making dashboards as consumable as possible

1. Limit the number of colors (<10 is ideal)
   • Contrast v. Color Family
2. Use colors to relate data points (Do these ideas belong?)
3. Consider the following variables:
   • Length
   • Area
   • Volume
   • Color
   • Density
4. Dashboard-wide filters or target filters
5. White Space
6. Sorting (Ascending v Descending)
Good v. Bad eggs
Good Dashboards

YAY! We really like these.
Good Dashboards

YAY! We really like these.
Good Dashboards

YAY! We really like these.
Good Dashboards

YAY! We really like these.
Work in Progress Dashboards

There’s room for improvement here.
Work in Progress Dashboards

There’s room for improvement here.
Work in Progress Dashboards

There’s room for improvement here.
Making Decisions

Suggested Resource

Chart Suggestions—A Thought-Starter

Comparison

Relationship

What would you like to show?

Distribution

Composition

www.SundaraDesign.com

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Resources

Get familiar with visualization and design concepts

• Dr. Andrew Abela’s Extreme Presentation tips
• Our whitepaper – 7 Visualizations You Don’t Use Enough Of
• Designing Enterprise – Ready Dashboards Webcast
• Color.adobe.com