FINDING THE STORY IN YOUR DATA

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https://www.nugit.co/what-is-data-storytelling/
Dashboards and spreadsheets only tell you what is happening. But, they do not tell you why.

Facts simply present data; whereas, a story's narrative provides context, which augments our understanding and drives valuable insights.
A COST ESTIMATE CONTAINS MANY STORIES
What type of data visualization would be most effective for telling this story?

• Table
• Bar chart
• Pie chart
• Heat map
## COST DRIVER STORY – USING A TABLE

<table>
<thead>
<tr>
<th>Bid Item 1 - Replace Pit Toilets with New Comfort Station</th>
<th>Materials</th>
<th>Labor</th>
<th>Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$301,503</td>
<td>70%</td>
<td>$281,286</td>
</tr>
<tr>
<td>Site Mechanical</td>
<td>$86,213</td>
<td>29%</td>
<td>$32,582</td>
</tr>
<tr>
<td>Exterior Enclosure</td>
<td>$35,992</td>
<td>12%</td>
<td>$29,477</td>
</tr>
<tr>
<td>Standard General Conditions</td>
<td>$31,900</td>
<td>11%</td>
<td>$101,200</td>
</tr>
<tr>
<td>Foundations</td>
<td>$30,028</td>
<td>10%</td>
<td>$33,082</td>
</tr>
<tr>
<td>Plumbing Systems</td>
<td>$26,655</td>
<td>9%</td>
<td>$16,121</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bid Item 2 - Construct New Parking Lot &amp; Site Utilities</th>
<th>Materials</th>
<th>Labor</th>
<th>Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$171,159</td>
<td>92%</td>
<td>$70,628</td>
</tr>
<tr>
<td>Site Improvements</td>
<td>$143,581</td>
<td>84%</td>
<td>$36,335</td>
</tr>
<tr>
<td>Site Preparation</td>
<td>$2,500</td>
<td>1%</td>
<td>$11,711</td>
</tr>
<tr>
<td>Site Mechanical</td>
<td>$12,153</td>
<td>7%</td>
<td>$14,232</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bid Item 3 - Picnic Area &amp; Trailhead Improvements</th>
<th>Materials</th>
<th>Labor</th>
<th>Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$67,348</td>
<td>88%</td>
<td>$47,645</td>
</tr>
<tr>
<td>Site Improvements</td>
<td>$59,448</td>
<td>88%</td>
<td>$25,960</td>
</tr>
</tbody>
</table>
TOP WBS COST DRIVER STORY – USING A HORIZONTAL BAR CHART

Replacing Toilets with New Comfort Station is Biggest Cost Driver!

- Bid Item 1 - Replace Pit Toilets with New Comfort Station: 60%
- Bid Item 2 - Construct New Parking Lot & Site Utilities: 28%
- Bid Item 3 - Picnic Area & Trailhead Improvements: 12%

Total: 100%
DIFFERENT STORY – SAME DATA!

Site Improvement Materials for New Parking Lot and Utilities Drive Overall Cost

- Materials: 48%
- Labor: 36%
- Equipment: 16%

Total: 100%
SAME STORY, DIFFERENT VISUAL – USING SIMPLE TEXT

54% of material costs are driven by site improvements or mechanical upgrades
POLL QUESTION

What data visualization tools are you using?

• Tableau
• Power BI
• Google charts
• Excel
STORYTELLING WITH DATA
The Storytelling with Data and Let’s Practice books were written for anyone who plans to use data to communicate something to others with the goals of

- Creating effective data visuals,
- Keeping your audience’s attention on your presentation, and
- Influencing decisions using your data story
THE IMPORTANCE OF STORYTELLING

• People love to hear stories!
  • They are useful for both entertaining as well as educating by providing a fun way to share knowledge and experiences
  • Storytelling helps your audience to connect with your data and care about your message
    • https://www.youtube.com/watch?v=mSi0kmqOBu4

• The world is getting inundated with information
  • Data is the new “oil”
    • Determining meaningful ways to sift the gold nuggets from all the dirt requires new skills
STORYTELLING WITH DATA OVERVIEW

• Understand the **context**
  • Know with **whom** you will be communicating to, what they **need to know**, and how you will **deliver** your message
  • Employ the **3-minute story**, the **Big Idea**, and **storyboarding** to articulate your findings

• Choose an appropriate **visual display**
  • When highlighting a number or two, **simple text** is best
  • Line charts work well with **continuous data**
  • Bar charts are perfect for showing **categorical data**, but must have a **zero baseline**
  • **Avoid 3D, pie charts, and secondary axes**

**Pilot program was a success**

After the pilot program, 68% of kids expressed interest towards science, compared to 44% going into the program.

**How do you feel about science?**

**BEFORE** program, the majority of children felt **just OK** about science.

**AFTER** program, more children were **Kind of interested & Excited about science**.

**Show the numbers directly**

**Use a simple bar graph when comparing two things**

• Keep them **close together**
• Align them to a **common baseline**

Eliminate clutter!

- Anything that does not support your message should be excluded
- Leverage Gestalt principles for how people see things and use contrast strategically
- Align all elements and maintain adequate white space
Focus attention where you want it

• Rely on the power of preattentive attributes to signal where to look

Think like a designer

• Include visual affordances that tell the audience how to read your graphic
  • Use highlighting and text to label and explain the story

Car sales by dealership: Q3

<table>
<thead>
<tr>
<th>DEALERSHIP</th>
<th># OF CARS SOLD</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAKESIDE</td>
<td></td>
</tr>
<tr>
<td>DRAPER</td>
<td></td>
</tr>
<tr>
<td>FILMORE</td>
<td></td>
</tr>
<tr>
<td>WILDLAND</td>
<td></td>
</tr>
<tr>
<td>SEACY</td>
<td></td>
</tr>
<tr>
<td>NORTH</td>
<td></td>
</tr>
<tr>
<td>ORLY</td>
<td></td>
</tr>
<tr>
<td>REGIONAL</td>
<td></td>
</tr>
<tr>
<td>SOUTHLAKE</td>
<td></td>
</tr>
<tr>
<td>BEACON</td>
<td></td>
</tr>
<tr>
<td>ROSEDALE</td>
<td></td>
</tr>
<tr>
<td>WESTLAKE</td>
<td></td>
</tr>
<tr>
<td>OAKLEY</td>
<td></td>
</tr>
<tr>
<td>PIERCE</td>
<td></td>
</tr>
<tr>
<td>MARE VALLEY</td>
<td></td>
</tr>
</tbody>
</table>
PACK LOTS OF DATA INTO A STACKED HORIZONTAL BAR GRAPH
New Marriage Rate by Education

Number of newly married adults per 1,000 marriage eligible adults

<table>
<thead>
<tr>
<th>Education Level</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>41.4</td>
<td>38.7</td>
<td>35.9</td>
<td>42.5</td>
<td>61.5</td>
</tr>
<tr>
<td>Less than high school</td>
<td>26.8</td>
<td>23.4</td>
<td>30.1</td>
<td>36.5</td>
<td>56.7</td>
</tr>
<tr>
<td>High school graduate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some college</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bachelor's degree or more</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Marriage eligible includes the newly married plus those widowed, divorced or never married at interview.
Source: US Census
Adapted from PEW RESEARCH CENTER

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<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor's degree or</td>
<td>62</td>
<td></td>
<td></td>
<td></td>
<td>57</td>
</tr>
<tr>
<td>Some college</td>
<td>43</td>
<td>37</td>
<td>30</td>
<td>27</td>
<td></td>
</tr>
<tr>
<td>High school</td>
<td>36</td>
<td>37</td>
<td>30</td>
<td>27</td>
<td></td>
</tr>
<tr>
<td>Less than high school</td>
<td>27</td>
<td>23</td>
<td>30</td>
<td>27</td>
<td></td>
</tr>
</tbody>
</table>

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CREATE A VISUAL HIERARCHY

Use color, create super categories to bucket data, and apply shading to highlight forecasts.

**Market size over time**

2018: Jan-Jun was a period of stability, with fairly steady growth (averaging +3% per month). There was a nearly 20% decrease in July, when Product X was recalled and pulled from the market. Total sales remained at reduced volume for the rest of the year.

2019: The year started at less than $1.6B, but increased markedly in February, when a new study was released. Total sales have increased steadily since then and this is projected to continue. The latest forecast is for $2.4B in monthly sales by the end of the year.

TELL A STORY USING ANIMATION

• Have a **plot**, some **twists**, and a **call to action** in order to create **tension**

• Live presentations allow you to “**walk**” the **audience** through the story of the visual
  • You build up to the overall results and conclusions over a **series of slides** or animation
  • However, a **standalone annotated version** is necessary
    • **Tells the story** without the voiceover
    • Ignoring these different needs can result in “**slideument**”

• Challenge is when you provide **too much data** at once, you lose your audience’s attention
  • **Leveraging animation** to walk the audience through the story is better
  • First step is to start with just a view of the **blank graphic**
    • Audience will have to **listen to you** to understand the finer details of what they are seeing
Build **anticipation** and retain audience’s attention

Blue dot is **starting point** for the story

Despite no marketing, # of **users doubled**

Users increased due to **friends and family promotion**

Growth flattened during time when **game was updated**

**Revamped game** and **social media** partnerships helped game to **go viral**
Annotated version captures **salient points** made during live story telling.

**Moonville: active users over time**

- **Sep-Dec 2013**: Moonville launched with 5K active users in Sep. Early feedback was mixed; still, the number of active users nearly doubled in the first four months.
- **Jan-Mar 2014**: The number of active users increased with steeper trajectory as a result of friends and family promotions.
- **Mar-Dec 2014**: Growth was marginal through the rest of 2014 as we halted marketing efforts to focus on quality improvements.
- **YTD 2015**: The revamped game plus partnerships with social media channels have been very successful. Given recent growth rate, we anticipate we will surpass 100K active users in June.

Data source: ABC Report. For purpose of analysis “active user” is defined as the number of unique users in the past 30 days.
TIPS FOR FINDING THE STORY IN YOUR DATA

Data storytelling is part science and part art (like cost estimating!)
• There are several best practices and guidelines to follow including
  • Knowing your audience and composing your story to meet their needs
  • Leveraging Gestalt design principles, using preattentive attributes, etc. to create a visual hierarchy of information

Rely on your artistic side to be creative and embrace diversity
• There are multiple ways to communicate with data and have fun
  • Exploring alternate visuals can help you discover your data story
  • Declutter your visuals so that you draw attention to what matters most
    • Push data to the back so it does not compete for the main message
    • Include only what you need to tell the story so it is easy to understand
  • Iterate and seek feedback from others about your graphics

Presented for the ICEAA 2021 Online Workshop - www.iceaaonline.com
SEEK INSPIRATION THROUGH GOOD EXAMPLES

• Use these websites to inspire you as you create your presentations

  • Chart Chooser http://labs.juiceanalytics.com/chartchooser/index.html
    • Download as Excel or PowerPoint templates and insert your own data

  • Chartmaker Directory http://chartmaker.visualisingdata.com/
    • Explore the matrix of chart type by tool and click the circles to see solutions and examples

  • Graphic Continuum https://policyviz.com/?s=graphic+continuum
    • The poster includes more than 90 graphic types grouped into six categories
    • Also, check out the related Match It Game and Cards as well as three ways to annotate your graphs

  • Interactive Chart Chooser https://depictdatastudio.com/charts/
    • Explore the interactive chart chooser using filters
EXPLORE ADDITIONAL RESOURCES

• With **Datawrapper**, you can create visualizations like the one below from Let’s Practice in minutes instead of hours!
  • [https://www.datawrapper.de/_/FqaTB/](https://www.datawrapper.de/_/FqaTB/)
  • It’s free to use and no sign-in is needed to try it out yourself

• With **Flourish**, explore and explain your data with stunning visualizations and stories
  • [https://flourish.studio/features/](https://flourish.studio/features/)
  • Publish, present or download a free public version (No need to code or install software)

• With **Google Data Studio**, unlock the power of your data with interactive dashboards and beautiful reports that inspire smarter business decisions
  • [https://datastudio.google.com/overview](https://datastudio.google.com/overview)
  • It is easy and free!