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2016 TONY AWARDS

PRINCIPAL CAST MEMBERS BY ETHNIC BACKGROUND

When you're gathered in "the room where it happens," what storytelling techniques will make your presentations sing? Here are a few ideas inspired by a Broadway masterpiece.

What Can the Musical 'Hamilton' Teach Us about Data Visualization?

By Beth Lassiter

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"How does a manager, VP, big executive, or an analyst, dropped in the middle of a sad, darkened room for one more conference, no context, no contrast, no common data look up and shake their head at one more chart—ugh!"

OK, you caught me. I am, indeed, in love with the hit Broadway musical "Hamilton." I went to see it in New York City in October 2016, and I spent the year prior listening to the album nonstop. I thought that when I actually saw the musical in person, my appetite

would be satiated. But it was not. I haven't slowed down. I've bought books, read articles, continued to listen to the album(s), and I find myself discovering new details every day.

And I'm not the only one. There are many of us all over the world. How did Lin-Manuel Miranda (the creator of "Hamilton") do it? How on earth did he create a masterpiece that has resonated with so many people—and one that we don't tire of?

I will switch gears here briefly, then, I promise, tie it all together.

How can we be so creative, powerful, and engaging in the arts, but we can't show a graph without our coworkers going to sleep?

Let me set the stage of a recent meeting I was in: The room is dark. The presenter is displaying graph after graph. I can't read the numbers. Every report looks the same. Everyone is quiet and seemingly nodding along—and I am dying. It's death by PowerPoint.

So, I find myself unconsciously scrolling through email on my phone, thinking about all the things on my to-do list, wondering what I'll cook for dinner, and generally doing whatever I can to stay alive.

You know what I'm *not* doing? Paying attention. I didn't *intentionally* check out, but I don't know why I'm here, I'm overwhelmed with numbers and colors, and I'm unsure what action I should take based on the information presented.

So, why can I listen to the same album a zillion times—same songs, same music, same words—with full attention, completely satisfied, but I can't get through a few minutes of a status report in a business meeting? How can we be so creative, powerful, and engaging in the arts, but we can't show a graph without our coworkers going to sleep?

Because we rarely tell stories with our data. And you know what one of the best stories is right now? You guessed it—"Hamilton." So, let's look at what we can learn from it.



WHO TELLS YOUR STORY?

The narrator defines the story, and their point of view matters. If you are telling the story of Alexander Hamilton from Alexander Hamilton's point of view, then you view yourself as a hero—"the ten-dollar Founding Father." If you're Aaron Burr (the man who killed Hamilton), you see him as a pretentious, know-it-all jerk who receives undeserved adoration and constantly thwarts your every move. If you're Eliza Hamilton (his wife), he's your heaven (and your hell when he breaks your heart).

This point of view matters—both as a consumer of the information and as the narrator of the information. I'm sure you've seen the same dataset presented two different ways that will result in two entirely different conclusions. As a narrator, you have the power to tell whatever story you want (and truth in data is its own topic—covered later in

this article). As a consumer, it's helpful to understand the narrator's point of view and what motivates them before making decisions based on said data.

The narrator must also understand what motivates and constrains the audience. One of the factors any playwright must consider is time—an audience has a limited attention span for each act, and for the entirety of the musical. Another constraint for the playwright was the historical knowledge of his audience. He could not assume that everyone attending the musical paid attention during US history in high school (*cough* *me* *cough*). Therefore, who Hamilton was and how he fit into American history had to be explained at a fundamental level. Miranda also sought to create a musical for a younger, "hipper" audience—which created both constraints of cost (ticket price) and opportunities of a new storytelling channel. Tickets to a Broadway show can be pricey, which can discourage a younger audience from attending, so Miranda implemented a ticket lottery (called "Ham for Ham") where the winners that day could attend the musical for just \$10. The opportunity for a hip-hop musical encouraged engagement with his audience using a language they live and understand.

You should also consider these same constraints and motivations for your audience:

- Who are they? What are their roles and levels? How do they fit into the organization?
- What decisions are they trying to make?
- What motivates them? Why?
- How can you speak their language?
- How will they interpret the story you tell? Can you anticipate their needs and concerns?
- How much time will they have to process the information? Adjust accordingly.

The takeaway: *The role of storyteller is incredibly influential—understanding your audience's motivations and constraints (as well as the narrator's) may very well lead to an encore performance.*

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WHAT'D I MISS?

In a recent interview, Lin-Manuel Miranda noted that if he were to have created a musical with themes of power, immigrants, and decision-makers in our country, it would be incredibly boring—but the conflict in the Hamilton/Burr story is engaging. He used the Burr conflict to tell the story about these “boring” themes. Instead of discussing immigration policy and how it has changed since the birth of our nation, he introduced us to Hamilton, an immigrant, who becomes a Founding Father. Instead of singing songs about power and autocracy, he tells us the story of George Washington stepping down as president so that our nation benefits from the spirit of rotation in leadership.

This is one of the biggest problems with reporting: We focus on themes over stories. If you're a data nerd like myself, you love the details, you love piecing those details together and learning the themes—and then you want to share it with your audience so they can make the best decisions possible. Those identified themes are important and need to be heard—but the problem is that we go into those meetings with the themes only and not the stories that the decision-makers need in order to be influenced. There are a few ways we can get better at drafting these stories over themes:

- Give examples of *real* people with *real* problems that illustrate your themes. The story will stick; the graph may not. Pick stories that speak to your themes, and answer the questions your audience will be asking. This can be voice-over to the awesome graph you've created, but the *story* is critical to audience retention and interest. One simple storytelling technique is setup -> conflict -> resolution (e.g., Aaron Burr / Alexander Hamilton), but this is not the only one. Get creative! Use your industry and your own business goals to illustrate. Pick a scenario that illustrates the theme, and tell the story accordingly.

I recently was in a meeting with a client where a customer experience problem of “too many touchpoints with a customer” was shown using Legos. The narrator placed a Lego person in a square on the table (representing the customer) for each touchpoint that occurred, and walked through a real example—and soon that square could not contain all of the Lego people. As the story continued, Lego people spilled out of the square and all over the table. Legos were everywhere! That moment told a real story about a real problem, and I often come back that visual when I am reminded of that particular problem.

- Minimize the themes. Limit yourself to the most important themes for the audience. The data may be telling you multiple, different important things, and you may need to inform the audience of those multiple, different important things—but don't do it all at once. Focus on the decisions that *this* particular audience needs to make at this particular time. What is most important to your audience *right now*?

In the above example, there were multiple issues that needed to be addressed regarding the customer experience, and all of them could have also been told tangentially using Legos during the above story. However, those tangents would have distracted from driving home the most important theme that needed to be heard during that meeting—that there were too many touchpoints.

The takeaway: Focus on story over themes, and limit those themes so that your audience finds itself thinking back on those themes after leaving the show.

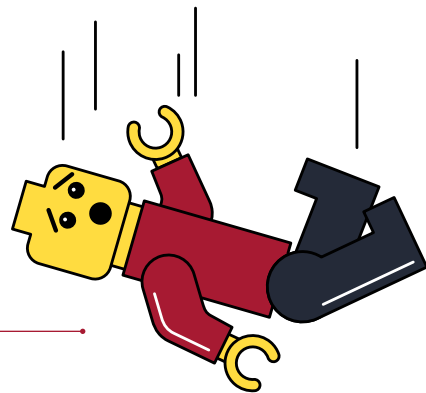


FIGURE 1

States Organized Alphabetically



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BLOW US ALL AWAY.

“Hamilton” makes use of two fascinating modes of storytelling: hip-hop and the use of people of color to portray white historical figures.

1. Hip-hop allowed Miranda to simply use more words so as to tell more story. It also made an old story new again, not only sparking interest among those whose only exposure has been pop culture, but also striking deep, resonating chords with those who grew up on hip-hop through the show’s subtle (and not so subtle) references to Biggie, Tupac, Busta, etc.
2. Casting people of color in these roles allowed the audience to have a new experience with these characters. George Washington is no longer the white guy with wooden teeth in a boat. He’s a compassionate, warm leader who relinquishes power for the good of the country. It also gave opportunities to actors of color, where opportunities do not always flourish.

So, what does this mean to you?

- Think about the platform you’re using to display data, whether it’s the type of graph you’re displaying (bar charts, pie charts, funnels, Legos, etc.) or the way in which you’re presenting the data (PowerPoint slides, Excel, email, etc.). Then, rethink it. What would resonate with your audience? How do you move them? Do something interesting so they walk away with a story that sticks with them.
- Get creative with the content of your display. A couple of ideas you might want to consider:
 - Consider a different axis orientation.
 - Use maps.
 - Use icons or other representations instead of numbers.
 - Use non-digital displays of data (like Legos) or the solar system to scale in a bottle.

If you need your audience to think differently about a topic, remove their previous visual cues about the topic.



- Use interactive visualizations if your audience needs to see the same information using different scenarios.
- Get creative with the channel of your display.
 - Display your visualizations in breakrooms, on people's desks, in hallways, in front of your business.

About ten years ago I saw a huge transparent box outside of a hotel. The box contained what seemed like a million tiny shampoo bottles. The displayer was addressing the waste and pollution involved with the hotel industry. To this day, I never stay in a hotel without thinking about that image and consider my own carbon footprint during my stay.
 - Use digital displays—in hallways, breakrooms, cafeterias, billboards, elevators. Or, if your message is for the public sphere, on billboards. What new platform can you use to grab your audience's attention?
 - Leverage social media. Share your visualizations with an external audience via LinkedIn, Twitter, or Facebook.
- If you need your audience to think differently about a topic, remove their previous visual cues about the topic.
 - Organize your data differently. Have you ever seen a US map organized alphabetically (Figure 1)? Doesn't like look a US map anymore, does it?
 - Use colors, text formatting, sizes, and symbols to highlight key points. Change them to draw your audience's attention.
 - Don't get so creative that you lose visualization best practices:
 - Color:
 - Contrast will draw attention
 - Analogous colors will create groupings
 - Use color intentionally—too many colors will confuse and muddle the message
 - Opt for 2-D instead of 3-D graphically when possible, as they're easier to read and communicate scale
 - Speaking of scale, use it consistently
 - Display from left to right, as Westerners read in that direction
 - Eliminate the need for the audience to bounce back and forth between areas (e.g., avoid using a legend that contains too many labels, causing the user to have to dart back and forth between the data point and the legend. A better way to display would be to imbed the legend values with the data points, assuming it doesn't create too much clutter)
 - Leverage the Gestalt Principles:
 - Law of Similarity—similar things tend to appear grouped together
 - Law of Simplicity—objects in the environment are seen in a way that makes them appear as simple as possible
 - Law of Proximity—things that are near each other seem to be grouped together (Figure 2)
 - Law of Continuity—points that are connected by straight or curving lines are seen in a way that follows the smoothest path
 - Law of Closure—things are grouped together if they seem to complete some entity
 - Law of Common Region—elements that are grouped together within the same region of space tend to be grouped together
 - Ground to Schneiderman's mantra:
 1. Provide an overview first
 2. Then zoom and filter
 3. Provide details on demand

FIGURE 2 – LAW OF PROXIMITY



- Create your visualization such that when you're not around, anyone who sees it can make sense of it (titles, legends, data sources, timestamps, etc.). Also be sure to provide insight on data quality and any exclusions that might have been made.

Note: Reference anything written by Edward Tufte for further information on the topic of data visualization best practices.

The takeaway: *Get creative and don't be afraid to tell stories that have never been told before in ways that have never been done before.*



SAY NO TO THIS.

Miranda based the musical on the book "Hamilton," by Ron Chernow. The book is 818 pages long—i.e., it has a ton of details about the man.

So, how does Miranda summarize that information into a three-hour musical so his audience isn't left exhausted? The answer: editing. As he has said, "For every detail I chose to dramatize, there were 10 I left out," and "What to leave out is probably the most important."

I think this is key to telling a good story with data. I have been in countless meetings where extraneous data is on parade. And for data geeks like myself, I get it. I am super fascinated by every twist and turn of the data, what is happening, and why. In other words, I don't just want to read the Chernow biography, I want to study it, research it,

and talk about all of it. But chances are, my audience doesn't care and/or doesn't have time for it. So, how do you turn the biography into the hit musical?

- Understand your central themes and make smart trade-offs. Miranda included King George III in the show, but not Ben Franklin. Why? Because King George was more important to the overarching theme of power—Franklin wasn't. That means you need to understand exactly what theme needs to be communicated to your audience and cut out the information that does not support that theme.
- Be concise. We've all seen those busy graphs with every possible data point included—and they may be important to the analysis of getting to the theme, but is there a way to consolidate visually for presentation layers? Is there a way to tell the story more cleanly without having to address each element? In the musical, Hamilton meets his best friends in a bar, but that's not what really happened. They were separate friends that he met at separate times in separate places. However, it was easy to consolidate their meeting to point to the fact that they are friends, rather than focus on the details of when and where they all met. Do you need to show the market share of your product versus ALL competitors? Or can you compare your product to those of your biggest competitors? What can you consolidate or remove to get to the theme?
- Become a minimalist. Eliminate noise and anything that is useless, noninformative, or information-obscuring. Create as much "white space" as possible. The more you can visually remove (without distorting the data or your story), the clearer your point will be. Some common examples of clutter:
 - Too many words—if you have to go to great lengths to explain your visualization, then rethink your visualization
 - Too many colors—use color strategically (as discussed in a previous section) and generally avoid using all available colors of crayons in one visualization (unless, of course, it is central to the story you are telling to use all the crayons!)
 - Too much "stuff" (extra boxes, background choices, complicated symbols)—Edward Tufte proposes that "every single pixel should testify directly to the content"

The takeaway: *Less is more.*



HISTORY HAS ITS EYES ON YOU.

Rumor has it that Alexander Hamilton may have had an affair with his sister-in-law, Angelica Schuyler. There is no smoking gun to point to this, but there are letters between the two that indicate, at a minimum, a strong connection between them. Chernow goes so far as to state in his book that at the time many assumed Alexander and Angelica were lovers. However, Miranda decided not to blatantly depict an affair between the two. Instead, he showed that there was mutual affection and dropped a few lines that make the audience pause and think to themselves, “Wait—is there something more going on between those two?”

Why did he use this approach? Because truth matters. Although the affair *MAY* have occurred, we don’t know that it actually did, and to depict it would be to state something we don’t know to be true—AND it would significantly alter the story. (You may note that above we discussed changing the locations where Hamilton met his friends in the interest of editing. Why is it okay there but not here? That grouping of information did not impact the story, context, or themes. However, stating that Angelica and Alexander had an affair *WOULD* impact the story, context, and themes.) Instead, Miranda portrayed the facts that we do have—mutual adoration and flirting via letters. He let the audience draw their own conclusions.

You have the freedom and ability to tell any story you want to tell—true, false, somewhere in between—and you can massage the data to support that story. There are entire books dedicated to using data visualization to intentionally mislead audiences. I am reminded of the quote, “If you torture the data long enough, it will confess to anything.” However, once you’ve misled an audience (whether intentionally or not), they may not trust you going forward. In fact, the principle of integrity in data visualization can make or break you. You can have the most creative, engaging visualization that has ever existed, but if you don’t have the truth, then you’ve lost your audience—not just now, but for the future as well. Following are some simple guidelines to avoid losing trust by anchoring to truth:

- **Be aware of your own biases.** Our experiences, aspirations, motivations, and prejudices are all at play and can influence the themes we want to see and stories we want to tell. For instance, if I am responsible for reporting on my team’s performance to leadership, then I will likely look for successful data points as opposed to challenges. So be aware that, as a human, you are not

objective—even if you have the best intentions. Instead, let the data speak for itself and allow the audience to draw their own conclusions.

- **Be consistent.** We discussed this above in regard to visualization best practices. In this instance, consistency not only allows the audience to easily digest the information you’re providing, but also gives them cues to scale and relativity. For example, don’t display one graph with a y-axis of 0–100%, and the next graph (containing the same type of information) with a y-axis of 90–100%. Instead, aim for both graphs to have the same scale. Create consistencies throughout to ensure your audience does not draw erroneous conclusions.
- **Aim for integrity.** This isn’t *just* about your own moral compass—it is also about data integrity. Yes, you should seek truth over manipulation, but despite your best moral intentions, you may be using “bad” data that is inadvertently misleading. For instance, is your sample size large enough? Or are your survey results based on questions that were worded in a way that would lead the audience to a specific answer? Or are you using data that isn’t adhering to data governance standards? Know the origins of your data, and aim for quality. However, if you must use data that is less than reliable, then fully disclose that to your audience. Allow them, once again, to draw their own conclusions.

The takeaway: *An audience’s trust can be earned by anchoring your story in truth and integrity.*

So, what comes next? This is a lot of information to digest and apply—and just like in “Hamilton,” there are many things left unsaid. However, if you can apply just a few of these principles, you will be well on your way to telling a more compelling story. I can’t promise a standing ovation, but I would bet your stories will keep your audience more engaged in the room where it happens. ★

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