

Chapter 5: Visual Storytelling

If I had more time, I would have written a
shorter letter
— Mark Twain

Learning Objective

- Learn why storytelling matters.
- Understand the science behind storytelling.
- Learn about various types of visual storytelling techniques.
- Learn why traditional way of presentation should be avoided.

Introduction

- In this chapter, we shift our focus from data exploration to data explanation or communication.
- Communication in this context is about how effectively we convey information from our exploration to a wider audience.
- Storytelling is considered as one of the oldest professions of human-kind [Johnson, 2019].
- Storytelling has long been one of the most effective methods of communicating knowledge throughout the history.

Introduction



Figure 5.1 Kamishibaiya telling a story in Tokyo.

Source: https://en.wikipedia.org/wiki/Kamishibai#/media/File:Kamishibai_Performer_In_Japan.jpg

- During the Great Economic Depression and the post war period in Japan, a form of pictorial storytelling known as ‘Kamishibai’ became very popular.¹
- The word Kamishibai translates to ‘paper play’.
- The person who used to narrate the story was called ‘Kamishibaiya’.

1. Source: <https://en.wikipedia.org/wiki/Kamishibai>

Introduction

- While telling a story, the kamishibaiya would display about 12–20 cards with various images drawn on them.
- Kamishibaiya used to tell a story by showing images on the cards by changing them by hand at a pace that synchronized with his pace of story.
- This small illustrated board was attached to his bicycle, from which he used to sell candy's to the people who came to listen to his stories.
- The key thing to this form of presentation was the visuals and the story.

Introduction

- In the eighteenth century, Joseph Priestley, a British Polymath, created a chart to visualize the lifespan of about 2000 historical figures.
- It was called “A Chart of Biography”.
- The chart covers 1200 BC to 1800 AD.
- It was considered as one of the most influential **timeline charts** of the eighteenth century.
- He believed that the chart “conveyed the information with more accuracy, and in much less time, than it would take by reading” [Thompson, 2016].
- Figure 5.2 shows a redacted version of the chart called a specimen of Chart of biography.

Chart of Biography

A Specimen of a Chart of Biography.

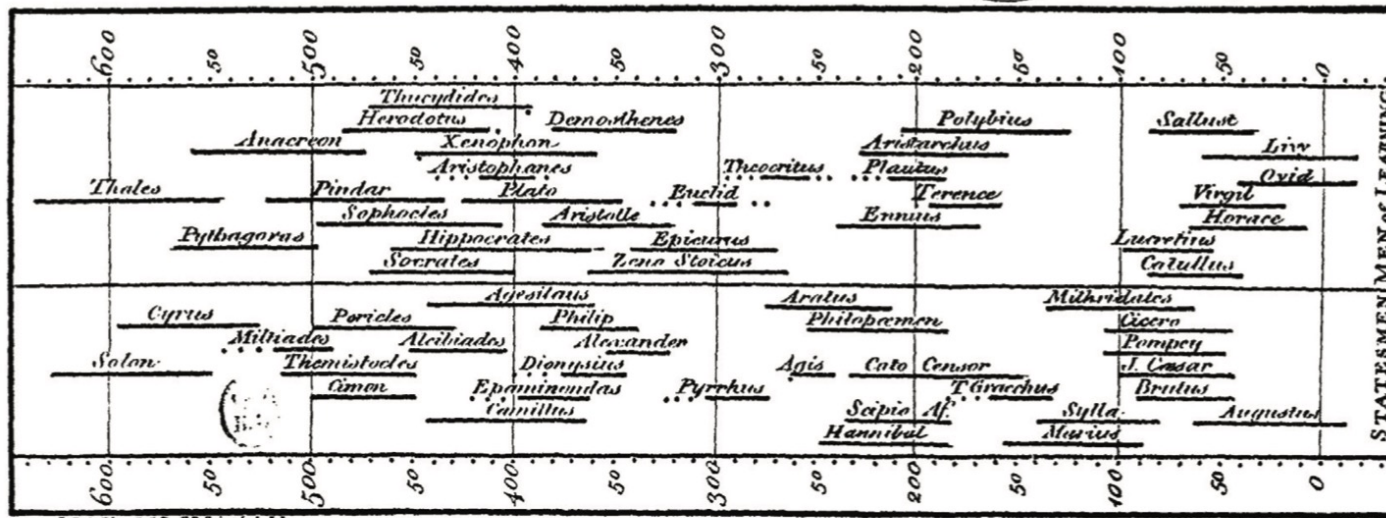


Figure 5.2 A specimen of a chart of biography.

Source: https://en.wikipedia.org/wiki/A_Chart_of_Biography

- This chart contains 59 individuals whose lifespan ranges from 600 BCE to 0 BCE.
- There are only two categories in the chart: “Men of Learning” and “Statesmen”.
- An individual’s lifespan is represented by a horizontal line, which starts at their birth year and ends at their death year.
- The dots before and/or after this period indicate the uncertainty of the lifespan

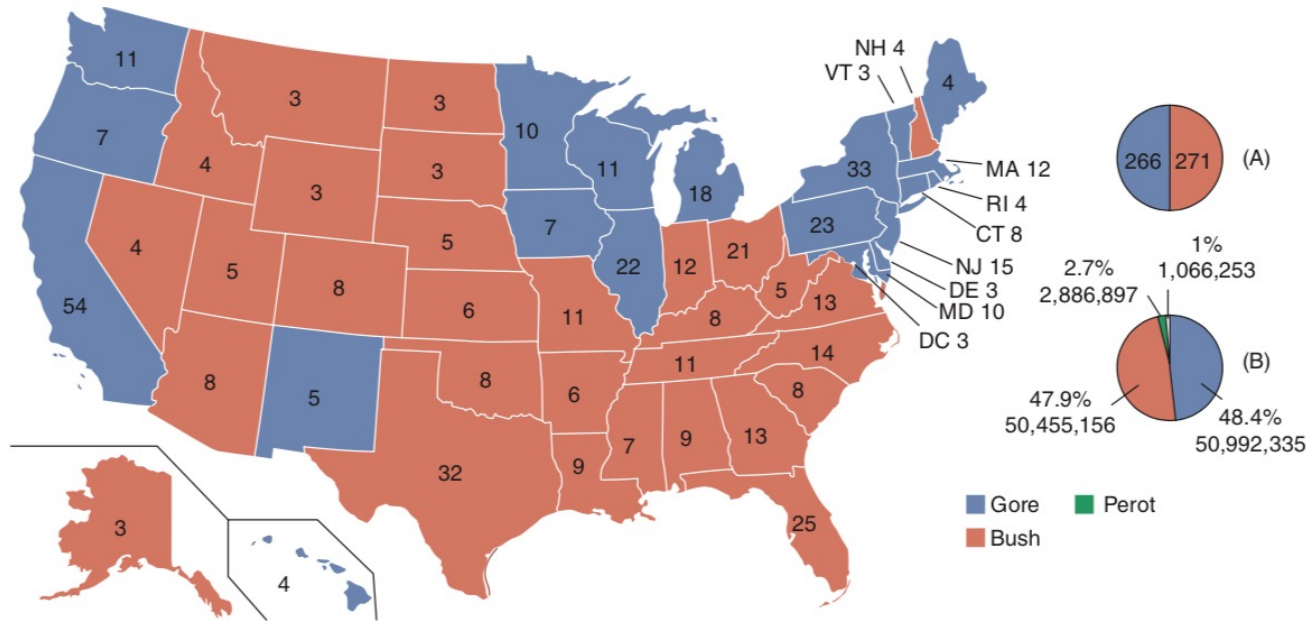


Figure 5.3 2000 Presidential electoral and popular vote.

Source: <https://commons.wikimedia.org/wiki/File:ElectoralCollege2016.svg>

- During presidential elections in the U.S.A., red states and blue states refer to states where a Republican candidate (red state) or a Democratic candidate (blue state) has been elected.
- During the 2000 US presidential election, different news channels used coloured infographics to represent the victory of Democratic (blue) or Republican (red) candidates.

- **Data should be able to speak to the eyes, “As the eye is the best judge of proportion, being able to estimate it with more quickness and accuracy than any other of our organ”.**

-William Playfair on the book
Linear Arithmetic

Why Storytelling Matters

- According to Jonathan, “We are, as species, addicted to story. Even when the body goes to sleep, the mind stays up all night, telling itself stories”. [Gottschall, 2013].
- let us perform a small exercise.

Why Storytelling Matters

- Let us recall our favourite movie and collect answers to these questions:
 1. **Who were the main characters in that movie?**
 2. **What did they do?**
 3. **What were they going through during the movie?**
 4. **What was the movie about, or what was the message the writer**
 5. **was trying to convey in that movie?**
- Most of these questions can be answered fairly easily. Even if we watched that movie a long time ago, we would still remember most details of the movie.

Why Storytelling Matters

- Now, try to recall last year's annual report of your company and try to remember the important statistics or updates in that report.
 1. **What were the details mentioned in the report?**
 2. **What did your company go through the year?**
- We will probably be able to recall very few details from that report.
- We will not be able to properly summarize the annual report to our colleagues so well, as much we will be able to describe our favourite movie.

Why Storytelling Matters

- This is what a good story does to our memory.
- It sticks in our mind and helps us store it for longer compared to data and facts.
- A good narrative keeps our audience engaged and provides them with a clear understanding of the message we want to convey.
- Cognitive psychologist Jerome Bruner suggests that facts are up to 22 times more memorable when presented in story form [Harrison, 2015].

Why Storytelling Matters

A 2020 Harvard Business Review article on storytelling says

“Whether you need to win over a colleague, a team, an executive, a recruiter, or an entire conference audience, effective storytelling is the key. [Gothelf, 2020]”

Science Behind Storytelling

- Whenever we listen to a presentation involving data, facts, and figures, our brain activates our language processing parts which are called Broca's area and Wernicke's area [Peterson, 2017].
- They help decode words and try to understand their meaning.
- However, weaving a story along with presentation helps light up a lot more parts in the brain.
- When someone passes on any information through a story, not only do the language processing parts of the brain get activated, but a story can also put our whole brain to work.
- This helps make a lasting impact on our brain.

Science Behind Storytelling

- According to neuroscience, three hormones get released in our brain when it is being told a story—oxytocin, dopamine, and cortisol [Zak, 2014].
- Uri Hasson, a neuroscientist at Princeton University, in his study concluded that when a person is telling a story, his brain activity can synchronize with the audience's brain activity.
- Another study at Drexel University also found that when a person is telling a story, the speaker's brain mirrors the listener's brain.

Science Behind Storytelling

- According to Dr. Paul J. Zak, an American neuro-economist, when we tell a story, it triggers oxytocin in the listener's brain [Zak, 2014].
- Oxytocin is the chemical responsible for building trustworthiness and promotes empathy.
- In simpler words, when we are being told a story, our brain reacts to it as if it too is experiencing it.
- This is the reason we feel goosebumps while watching a fight sequence in a James Bond movie, or we cry when Joker kills Robin in Batman.

Science Behind Storytelling

Yuval Noah Harari [Harari, 2015], an Israeli historian and author of “Sapiens: A Brief History of Humankind” wrote

“It is the distinctive ability to believe in stories that separate sapiens from other creatures. It is impossible to convince a monkey to give us a banana by promising him limitless bananas after death in monkey heaven” [Harari, 2015].

Presentation Zen

- Presentation Zen is an approach proposed by Garr Reynolds to break the barriers of conventional ways of using PowerPoint presentations and make them more thoughtful, engaging, and interesting to audience [Reynolds, 2011].
- In his opinion, applying a few basic rules from Zen to our presentation approach can help us communicate more effectively and build connections with our audience.

Presentation Zen

- The Presentation Zen approach consists of three key elements: Restraint, Simplicity, and Naturalness.

“The principles I am most mindful of through every step in the presentation process are restraint, simplicity, and naturalness. Restraint in preparation. Simplicity in design. Naturalness in delivery. All of which, in the end, lead to greater clarity for us and for our audience” [Reynolds, 2011].

Presentation Zen

Restraint-

- Every word, every visual in the presentation should be necessary, no unnecessary junk should be kept.
- Slide should not be text-rich, rather must contain one main idea that should grab the audience's attention.

Presentation Zen

Simplicity-

- The white spaces in a slide should be used wisely and be filled with as few words as possible.
- Presentation will be more powerful and to the point when the slide is uncluttered

Presentation Zen

Naturalness-

- When we simply read the text from our slides, we create disconnect with our audience.
- It is quite difficult for humans to read and to listen at the same time.
- A good eye contact with our audience signifies confidence, engagement, and interest.
- It helps in building a connection with our audience and makes them want to listen to you more carefully.
- Including a story and humour to our presentation are the key to build an enjoyable experience for our audience.

Presentation Zen

- According to Heath brothers (Heath, 2007), an idea that is made to stick, has six attributes:
 - Simple,
 - Unexpected,
 - Concrete,
 - Credible,
 - Emotional, and
 - Stories.
- The overuse of bullet points, different fonts, complex images, and long texts give an overall impression of **clutter** on screen.

Pecha-Kucha

- Pecha-Kucha (meaning chitchat in Japanese) is a kind of Zen form of presentation that puts a strong emphasis on visuals and has become the world's fastest growing presentation style.
- This is a 20*20 presentation format.
- This implies that in this presentation format a presenter is allowed to present 20 slides for 20 seconds each.
- A typical Pecha-Kucha presentation lasts for six minutes and 40 seconds.

Pecha-Kucha

- Pecha–Kucha is used by businesses around the world to present complex projects.
- Schools are using it as a study tool for both teachers and students.
- People are customizing this format to fit their needs by increasing the number of slides or time per slide.
- The philosophy remains the same: **“talk less, show more”**.
- Pecha–Kucha is heavily reliant on stories and visual aids.
- The key to this style of presentation is simple visuals which you explain by crafting a story around it.

Pecha-Kucha

As William Penn rightly said,

“Speak properly, in as few words as you can, but always plainly; for the end of speech is not ostentation, but to be understood.”

Death by Presentation

- What makes a presentation memorable?
- The answer is stories.
- A story wrapped with information, visualizations and emotions is what makes a presentation that sticks with the audience's memory.

Death by Presentation

- Businesses are working hard to break out of the “Death by PowerPoint” mould.
- It is a metaphor popularly used in businesses and caused by long, cluttered, and boring PowerPoint presentations, and the presenter who believes that giving a presentation means reading 50 slides in an hour.
- But sometimes “Death by PowerPoint” is not just a metaphor, it is a real thing. Sometimes literally.

Death by Presentation

- The story of the demise of the national hero of India, Kalpana Chawla, an Indian American astronaut, along with her six crew members who died in space shuttle Columbia crash, perfectly fits the saying, “Death by PowerPoint”.
- A badly designed PowerPoint slide helped kill them in space shuttle Columbia crash [Anon, 2019].

Death by Presentation

- On January 16th, 2003, the space shuttle Columbia was launched on the STS-107 mission.
- In addition to Kalpana Chawla, there were six other crew members.
- The launch happened normally, but at the 82nd second mark after the lift-off, a piece of Spray on Foam Insulation (SOFI) broke off from the shuttle's external tank and hit the outer edge of the shuttle's left wing.
- Researchers and engineers from the Earth could not tell how much damage this foam would have caused, when it hit the left wing. However, it was clear that something had gone terribly wrong.

Death by Presentation

- The team back on Earth discussed several possibilities.
- The astronauts could have visually inspected it by doing a spacewalk and informed the people on Earth about the extent of the damage.
- NASA could have launched another space shuttle that could pick up the crew, or
- NASA could have simply assumed that the object could not have damaged the left wing effectively and could risk re-entry of Columbia in the Earth's atmosphere.

Death by Presentation

- NASA officials asked the Debris Assessment Team to brief the Mission Evaluation Room on their analysis of the situation.
- They prepared three reports and 28 slides in their PowerPoint presentation.
- After the presentation, the engineers felt they had effectively communicated the risks to the NASA's managers.
- NASA managers, however, based on the presentation concluded that Columbia was safe and there is no danger to the lives of the crew members.
- They discarded all the other options and decided that Columbia could re-enter the Earth's atmosphere as normal.

Death by Presentation

- The space shuttle Columbia disintegrated near Dallas during its re-entry into the Earth's atmosphere on February 1st.
- All seven crew members lost their lives.
- So, What went wrong?

Death by Presentation

- Edward Tufte, a Yale Professor, examined how the PowerPoint presentation used by the Debris Assessment Team which misrepresented key information.
- In his analysis, he noted that the slides were cluttered with too many bullet points, too much text in multiple font sizes and long sentences.

Death by Presentation

Review of Test Data Indicates Conservatism for Tile Penetration

- The existing SOFI on tile test data used to create Crater was reviewed along with STS-107 Southwest Research data
 - ✓ Crater overpredicted penetration of tile coating significantly
 - Initial penetration described by normal velocity
 - Varies with volume/mass of projectile
 - Significant energy is required for the softer SOFI particle to penetrate the relatively hard tile coating
 - Test results do show that it is possible at sufficient mass and velocity
 - Conversely, once tile is penetrated SOFI can cause significant damage
 - Minor variations in total energy can cause significant tile damage
 - ✓ Flight condition is significantly outside of test database
 - Volume of ramp is 1920cu in vs 3cu in for test

The slides were cluttered with too many bullet points, too much text in multiple font sizes and long sentences.

“Significant” and “Significantly” were used multiple times but none of these terms refer to “statistical significance” in its technical sense.

The most important information is written in the smallest font i.e., “the flight condition is significantly outside of test database. Volume of ramp is 1920 cu in vs 3cu in for test.”

Death by Presentation

- Due to the unnecessary ink and misleading title, the managers were distracted from coming to the correct conclusion.
- In addition, the title did not convey the message that engineers would have wished to convey.
- The title should convey the message that your audience would understand and remember.
- If that slide was titled as “the foam strike more than 600 times bigger than test data” then perhaps the NASA officials would have considered other options rather than letting the space shuttle Columbia re-enter at the risk of all the crew members’ lives.

Death by Presentation

An improved version of the slide is shown in Fig. 5.5.

The Foam strike 600 times bigger than test data

- Test data indicates
 - Conservatism for tile penetration, but
- Columbia flight is way out of tested range
 - One fragment estimated at 1920 in³ vs. 3 in³ for tests

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Thank You!