

STORYTELLING WITH DATA VISUALIZATION

PLAYBOOK

Introduction

About the Storytelling with Data Visualization Playbook

Welcome to the world of data visualization storytelling! If you're a finance professional looking to make sense of your complex data and communicate your insights with ease, you're in the right place.

In this playbook, we'll guide you through the captivating realm of visual narratives, where you'll discover how to turn your financial data into a compelling story that'll capture your audience's attention and leave a lasting impact.

This comprehensive guide dives deep into the art and science of transforming complex data into engaging narratives. Explore cutting-edge best practices, insightful data preparation strategies, and more to help transform you into a master storyteller.

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Chapter 1:

Introduction to storytelling with financial data

What is data visualization?

Data visualization is all about taking data and presenting it in a way that's easy to understand. Rather than staring at spreadsheets or numbers, you can use colorful charts, graphs, and other visuals to help make sense of complex data.

The goal of data visualization is to make the information more accessible, understandable, and interesting. It helps you see patterns and trends that might not be immediately apparent when you're looking at rows and columns of numbers. With data visualization, you can quickly identify what's working, what's not, and where there might be room for improvement.

Effective data visualization requires careful consideration of the financial data presented, the target audience, and the desired outcomes.

What is data storytelling?

Data storytelling is the art of transforming raw, numerical data into visually compelling narratives that captivate your audience. It combines the power of data analysis with the impact of storytelling to present financial information in a way that's clear, engaging, and actionable.

By using a variety of visualization tools – such as bar charts, scatter plots, timelines, graphs, heat maps, and more – you can paint a vivid picture of your data, making it easier for non-finance professionals to grasp and act on your insights.



"It's predicted that around 120 zettabytes (ZB) of data will be produced in 2023; in 2010, it was 2ZB! Businesses have more data than ever available to them but there is no point in producing and storing it if it is not used to gain insights and drive decisions. That's where Data Visualisation comes into play. It is the art of bringing together large, sometimes disparate datasets and presenting them in a digestible form.

"If done right, it can be a perfect balance of quantitative and qualitative analysis, i.e. giving key results and KPIs but with a visual representation of the reasons driving these outcomes. It helps with absorbing information about data quickly. As data volume inevitably increases, visualization manages influxes of new information and makes it easy to find trends, understand requirements, and to see correlations between business conditions that could otherwise go unnoticed.

"Among its many benefits, it can give leaders the ability to manage by exception, dashboards, and visuals can direct them to areas that most need their time and resources e.g. highlighting risk and possible mitigation."

**Liam Boyle, Data Analyst at
Future Beauty Labs**

Why should you care about data storytelling?

In the fast-paced world of finance, it's essential to communicate complex data effectively and efficiently.

But why should you, as a finance expert, care about telling stories with data?

Here are five key reasons:

1. Crystal-clear communication

Finance can be a bit, well, dry. But with data storytelling, you can spice things up and make even the most multifaceted concepts digestible. This way, you ensure your insights don't get lost in translation and can be easily shared across the organization.

2. Bridging the gap

Finance professionals and non-finance stakeholders often speak two different languages. Data storytelling serves as a translator, helping both sides better understand and act on financial insights.

3. Fast, data-driven decisions

In the high-stakes world of finance, time is money. By transforming data into visually appealing narratives, you can help your team and stakeholders quickly identify trends and potential risks, empowering them to make informed decisions *without* getting bogged down in spreadsheets.

4. Increased collaboration

Visual narratives foster cross-functional collaboration by breaking down barriers between finance and other departments, leading to a more unified approach to problem-solving and decision-making.

5. Stand out in the boardroom

As a finance professional, you've got the skills to pay the bills. But by mastering the art of data visualization storytelling, you can elevate your role and become the go-to expert for data-driven insights. After all, who doesn't love a good story?

Chapter 2:

Data Preparation and Cleaning

What is Data Cleaning?

Data cleaning is the process of identifying and correcting errors, inaccuracies, and inconsistencies in raw data. This is important because it involves removing duplicate entries, filling in missing data points, and standardizing data formats to ensure the data is accurate and consistent.

Financial data must be 'clean' to be used for analysis and visualization. By cleaning the data, you can prevent errors and incorrect insights, which can be a costly and time-consuming mistake further down the line.

What is data preparation?

Data preparation is the process of transforming and organizing raw data so that it can be used for analysis and visualization. This involves a range of tasks, such as selecting relevant data, aggregating data, and creating calculated fields.

Data preparation is a crucial step in financial data storytelling because raw data is often complex and difficult to understand. By organizing the data in a way that makes sense and is easy to interpret, you can generate meaningful insights and create compelling visualizations.

For example, let's say you're working on a financial report that requires you to analyze data from multiple sources, including spreadsheets, databases, and text files. Data preparation involves bringing all this data together, cleaning it, and organizing it in a way that makes sense.

This might involve removing duplicate entries, standardizing data formats, and creating new columns that calculate key metrics. By doing so, you can create a cohesive data set that's ready for analysis and visualization.

Remember!

Data preparation is not a one-time process. As new data is generated and added to the data set, you must continue to update and refine the data preparation process to ensure the data remains accurate and useful.

Data cleaning techniques

There are a few commonly used data cleaning techniques to help you ensure data is clean and free from inaccuracies. Here are a few:

1. Remove duplicates

Duplicated data entries are more common than you might think and tend to occur during data collection. This can lead to inconsistencies and errors in your analysis and visualizations. By removing duplicates, you can ensure that your data is accurate and consistent.

Fix this issue in Excel by using the "Remove Duplicates" function to identify and remove duplicate entries.

2. Fill in missing values

Have you ever tried to solve a puzzle with missing pieces? It's frustrating! The same goes for missing data in your dataset. Missing data can be a major problem when it comes to analysis and visualization. It can skew your results and make it difficult to draw accurate conclusions. By filling in missing values, you can ensure your analysis and visualizations are based on complete and accurate data.

Use Excel's "Fill Down" function to fill in missing values.

3. Correct inaccuracies

Inaccurate data can lead to incorrect insights and incorrect decisions. Taking time to correct errors ensures your data is reliable and trustworthy.

Review your data for errors manually or use "Find and Replace" in Excel to correct inaccuracies.

4. Standardize data formats

Standardizing data formats ensures your data is compatible and easy to work with. If your data formats are inconsistent, it can lead to errors in your analysis and visualizations.

Use the "Text to Columns" function in Excel to standardize data formats.

5. Remove irrelevant data

Irrelevant data can clutter your dataset and make it difficult to draw meaningful insights. Removing irrelevant data allows you to focus on the most important information.

Fix this problem in Excel with the "Filter" function to remove irrelevant data.



"But remain open to the fact that there is no such thing as a "single version of the truth", there will be multiple angles of the same data and people will use filters to see what's important to them.

"Just be aware of these differences with your business partners and make sure they are also aware."

Soufyan Hamid, Finance Presentations Coach at SouFBP

Chapter 3: **Best practices**

9 expert data storytelling tips



Liam Boyle, Data Analyst at Future Beauty Labs, shared his expert tips and advice for creating compelling stories with financial data:

The old adage that a picture paints a thousand words is very true when it comes to data

visualization, except in this case it could be a thousand megabytes. It's all about portraying information in a digestible and actionable form.

Some do's and don'ts when it comes to building visualizations and being an effective data journalist include:

1. Know your audience

As a data storyteller, you need to produce visualizations that'll work for all stakeholders and give them what they need. Understand that some users will only want to see the high-level numbers, but others will like the ability to "drill down" into certain aspects and learn more.

One simple option for creating hierarchies in the story is to utilize bookmarks and links to further visuals to allow users to jump from one visual/report to the next. It's also paramount to be aware of sensitive data and the audience who will have access.

2. Set clear objectives

Just like every project, be clear about the aims and objectives of your stakeholders. What are they trying to achieve and what answers do they need from the data?

3. Adopt an agile approach to building dashboards and reports

Check in often that what you're building is telling the right story. Don't fall into the trap of "cherry picking" data for the purpose of meeting a milestone or making a visual work. The data needs to tell the whole story, not part of the story.

4. Name your visuals appropriately

Simple descriptive headings can give all the context a user might need for what a visual is portraying. On the topic of text, I've always found it better to use simple fonts, e.g. Sans, and keep headings to a consistent size.

5. Be wary of showing "too much"

TMI can lead to TL;DR which defeats the purpose of data visualization. If your visuals or legends are being truncated, you're probably trying to show too much and should consider a different visual or table. Tables are still visuals and very powerful when used in the right scenarios to show small lists of pertinent data.

6. Highlight KPIs

When utilizing tables, make good use of conditional formatting to highlight KPIs and draw a user's attention.

7. Don't over-slice the pie

Much like at the bakery, a pie with too many slices is probably ugly and not quite satisfactory. Avoid using these when there are too many categories. The same goes for donuts! The right chart should make the data easier to understand but also present it in the right light to the user. For example, a simple dial chart can be compelling for showing progress toward a goal.

8. Choose colors wisely

When it comes to colors, keep it simple and the palette consistent. For example, if you have used blue to represent gross sales on one visual, don't use green on another. Relating back to knowing your audience, be cognizant of any stakeholders who may be color blind. There's also no need to reinvent the wheel, RAG ratings still work very effectively and are universally known.

9. Use the space available to tell an effective story

Don't add an extra visual just because you can, rather enlarge the key visuals which give the user the main results they need. It can also be important to use different perspectives to draw attention to the most important visuals, i.e. the bigger the point, the bigger the visual.

3 key principles of financial data storytelling

We asked Soufyan Hamid, Finance Presentations Coach at SouFBP, to share some of the key principles of data storytelling in finance, and here's what he had to say:

The question you have to ask yourself is whether the data visualization is necessary. Many times, explaining the issue is sufficient.

But most of the time in finance, they'll be needed and for that, the key principles are:

- 1. Simplicity:** If a chart is more complex than a table, it's not doing the job of giving the message and supporting your speech.
- 2. Accuracy:** When I say accuracy, I am not saying that it must show all the details but it must not mislead the audience. Many times, we see charts where we play with the axis and give the impression that a bar is far longer than another but it's not the case.
- 3. Tailored:** In the age of business intelligence (BI) and dashboard solutions, efficiency is taking the lead. But the thing is when used in a presentation or a report, you have to tailor the colors, the labels, and the explanations to support your point. If you give a standard chart, you don't do the job of analyzing it for the reader.

Choosing the right graph or chart type

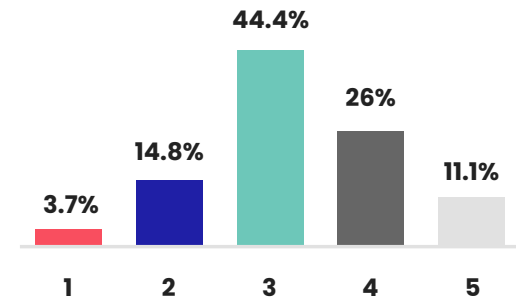
Choosing the right type of visual for your financial data is crucial because it can make all the difference in how well your audience understands the information you're presenting. Think of it this way – would you rather look at a bunch of numbers and hope you can figure out what they mean, or see a clear and visually appealing chart that makes the information easy to understand?

Different types of visuals work better for different types of data and selecting the wrong one can cause confusion and misinterpretation. For example, using a bar chart when a line chart is more appropriate can obscure trends and make it more difficult for viewers to see patterns.

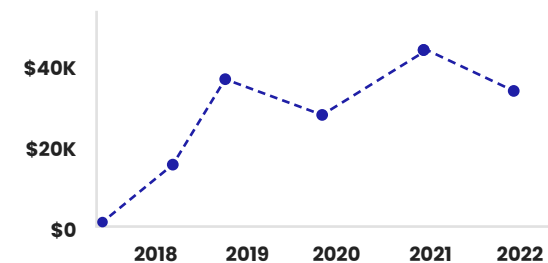
Ultimately, selecting the right type of visual is key to ensuring your data is communicated effectively, and your insights are understood. By using visuals that are clear, concise, and engaging, you can make a more significant impact on your audience and drive better decision-making.

Selecting the right visualization for your data is paramount. Here's a quick guide to help you choose:

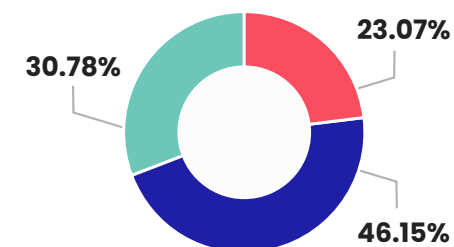
Bar chart: Ideal for comparing categories or showcasing changes over time.



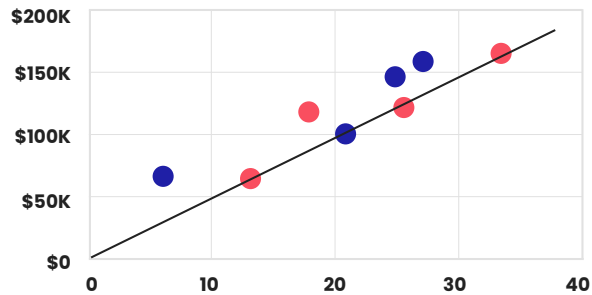
Line chart: Great for illustrating trends and time-series data.



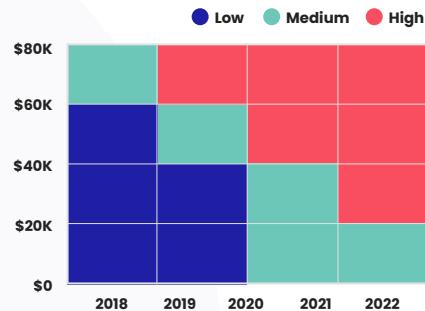
Pie chart: Perfect for showing proportions or percentages of a whole.



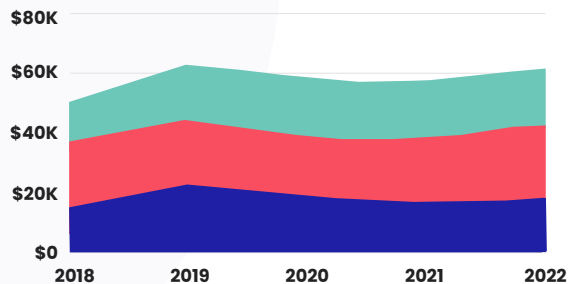
Scatter plot: Best for displaying the relationship between two variables.



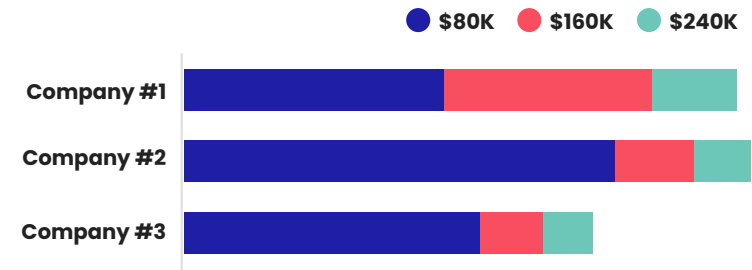
Heat map: Excellent for visualizing data density or concentrations.



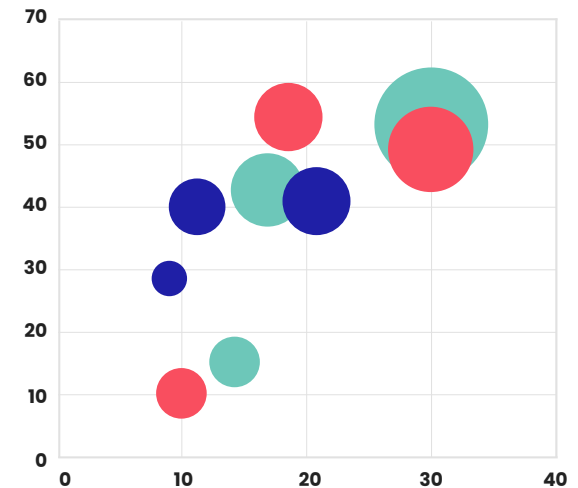
Area chart: Useful for highlighting the magnitude of change over time and emphasizing trends.



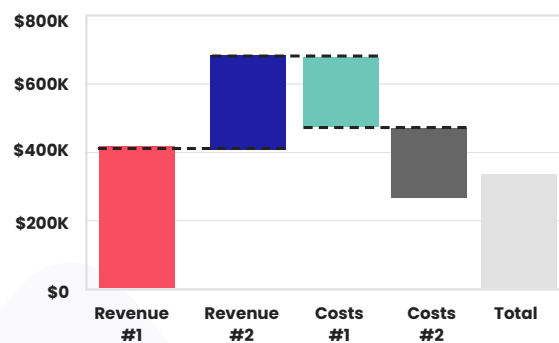
Stacked bar chart: Effective for showing the composition of categories or the distribution of data across multiple groups.



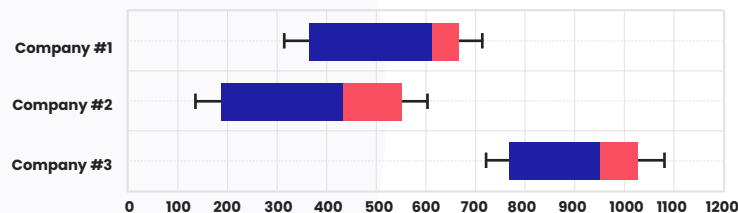
Bubble chart: Ideal for representing three or more variables simultaneously, while showing the relationship and differences between them.



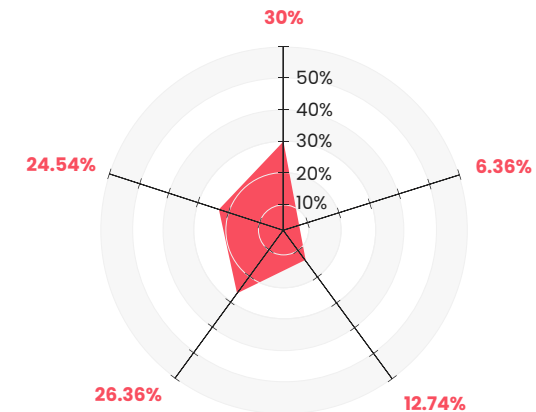
Waterfall chart: Excellent for visualizing the cumulative effect of sequentially introduced positive or negative values, typically used for understanding the incremental contribution of different factors to a final value.



Box and whisker plot: Ideal for displaying the distribution of data, highlighting outliers, and showcasing the central tendency and dispersion of a dataset.



Radar chart: Useful for comparing multiple quantitative variables, showcasing the performance or profile of different entities across various attributes.



"Basically, in finance, I will recommend three charts:

1. Line charts for evolution over time for a continuous metric.
2. Bar/column charts for separable elements (like months).
3. Waterfall chart when comparing two scenarios.

"You could use a combo chart (line + columns) to compare an evolution of two scenarios for example (actuals vs budget)."

Soufyan Hamid, Finance Presentations Coach at SouFBP

Using Color Effectively

Color is an incredibly powerful tool in data storytelling, capable of evoking emotions, drawing attention, and communicating complex information quickly and effectively.

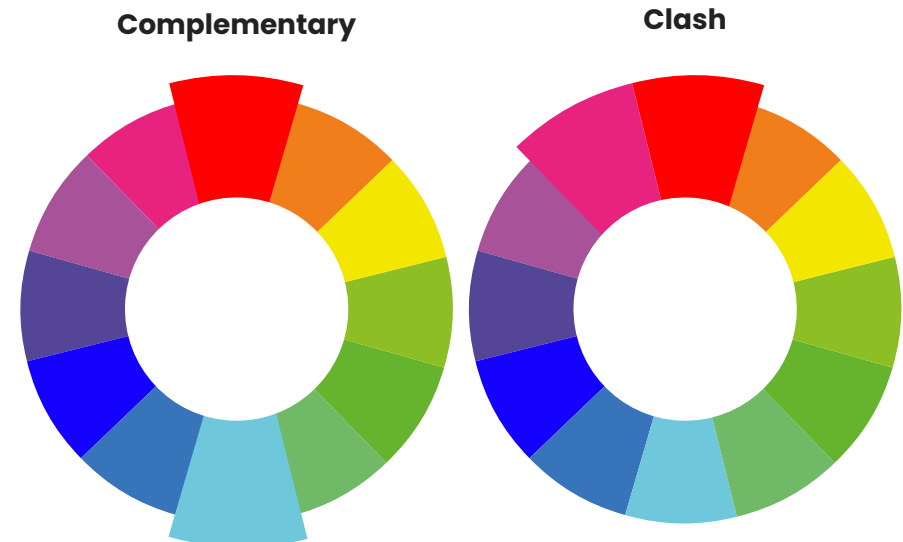
When used right, color can help viewers differentiate between different data points and highlight key insights. By using different hues, shades, and tones, you can create visual hierarchies that make it easier for viewers to understand data at a glance.

For example, using bright colors to highlight important data points can help draw the viewer's attention to critical information, while more muted colors can help balance the composition and make the visualization easier to read.

Color selection: Which colors work best?

When it comes to color selection, it's essential to choose colors that work well together and don't clash. Color combinations on opposite sides of the color wheel complement each other, such as blue and orange, which tend to work well together and can create an appealing visual contrast. Others, like red and green or purple and yellow, can clash and make it difficult for viewers to distinguish between different data points.

Here's an example of how some colors work well together and others tend to clash:



The psychology of color in data visualizations

Good data visualization isn't just about choosing colors that look good together – it's also about considering the cultural and emotional associations that different colors can evoke.

For example, red is often associated with danger or excitement, while blue evokes a sense of trustworthiness and stability. Understanding these associations can help you reinforce your message and create a more impactful visualization.

Colors and emotions:

Red: Often associated with excitement, passion, and danger, red can be a good choice for highlighting important information or drawing attention to key insights. However, overusing red can be overwhelming, so it's best used sparingly.

Blue: Tends to evoke feelings of trustworthiness, stability, and calmness, blue is a versatile color that can work well in a variety of data visuals. It's also easy on the eyes, making it a good choice for longer presentations or reports.

Green: Commonly linked with growth, prosperity, and balance, green is a good choice for financial data visualizations. It can also be calming, making it a good choice for visuals or presentations that require a lot of detail.

Yellow: Universally tied with happiness, optimism, and energy, yellow is perfect for highlighting important data points.

Orange: Usually connected with enthusiasm, creativity, and warmth, orange is great for increasing energy or excitement. It's also ideal for highlighting key insights.

Purple: Traditionally paired with luxury, creativity, and sophistication, purple gives the impression of elegance. However, it's another color that can be overwhelming if used too much, so just make sure to use it sparingly.

Gray: Generally tied to neutrality, formality, and professionalism, gray can help create a balanced and professional-looking visualization. It can also help highlight other colors and create contrast.

7 tips for using color in your data visualizations

1. Highlight key insights

Use color to draw attention to important data points or trends that you want your audience to focus on. This will help you make your message more impactful and memorable.

2. Contrast is key

Choose contrasting colors to differentiate between different categories or segments in your visualization. This will help ensure your audience can quickly and easily understand the information you're presenting.

3. Consider accessibility

Keep in mind that not all viewers may be able to see colors the same way. Consider using color-blind-friendly palettes to ensure that everyone can access the information in your visualization.

4. Keep it simple

Limit the number of colors you use to avoid overwhelming your audience. Stick to a few key colors that work well together and complement your data.

5. Purposeful color choices

Be purposeful with your color choices. Consider the cultural and emotional associations of different colors when selecting them for your visualization.

6. Consistent color scheme

Use a consistent color scheme throughout your visualization to create a cohesive and professional look.

7. Create a visual hierarchy

Use color to create visual hierarchies that make it easy for viewers to understand the data at a glance. For example, you could use a bright color to highlight a key data point and a more muted color for supporting data.



"You can use generally accepted colors that lead to a "normal" emotional response like green for positive or red for negative.

"Another important element that I always enforce when training teams is to use the company's color palette and not the standard Excel colors.

"It will show your business implication, people will recognize them and feel more confident and it will be standardized.

"A last important point regarding colors is to make sure to cover for color blind people and replace green by blue and red by orange/yellow."

**Soufyan Hamid, Finance Presentations
Coach at SouFBP**

Chapter 4:

How to tell a compelling story with financial data

Why do you need to tell a story with data?

When it comes to financial data, telling a story is key. Not only does it make complex information more digestible for your audience, but it also helps you build credibility and influence within your organization.

Think about it – a compelling story can connect with your audience on an emotional level and help them truly understand the impact of your insights. Plus, by presenting your data in a memorable way, you can position yourself as a thought leader and expert in your field, making it easier to gain buy-in for your ideas.

But that's not all. Storytelling with financial data can also help you uncover hidden patterns and trends that might not be immediately apparent when looking at raw data. By weaving your data into a narrative structure, you can connect the dots between different data points and uncover new insights and opportunities that might have otherwise gone unnoticed.

In short, telling a story with financial data is a must-have skill for finance professionals. It helps you communicate complex information, build credibility, and uncover new insights that can drive better business decisions.

7 steps to craft an engaging narrative with data

Data visualization storytelling is not just about presenting financial data – it's about crafting a compelling narrative that resonates with your audience.

Here are steps to help you craft an engaging story with financial data:

✓ **Step 1 – Identify your audience**

Tailor your story to the needs and preferences of your stakeholders, whether they are senior executives, peers, or non-finance professionals. Understand who you're presenting to and what information is important to them. This will help you tailor your story to their needs and make your data more relevant and engaging.

✓ **Step 2 – Define your goal**

What do you want to achieve with your story? Whether it's driving a decision, showcasing a trend, or highlighting a risk, your goal should guide your narrative.

✓ **Step 3 – Identify the key message**

Identify the main point of your story and use it to guide your narrative. This should be a clear and concise statement that summarizes the key insights from your financial data.

✓ **Step 4 – Choose your data wisely**

Select the most relevant data to support your story. Avoid overwhelming your audience with too much information or unrelated data points. This means selecting data that is relevant, accurate, and easy to understand. Use financial data visualization techniques such as charts, graphs, and dashboards to help make your data more visually appealing and easier to interpret.

✓ **Step 5 – Craft a compelling storyline**

Craft a storyline that engages your audience and leads them on a journey. Use a narrative structure that includes a beginning, middle, and end, and use storytelling techniques such as analogies, metaphors, and examples to make your story more relatable and engaging.

✓ **Step 6 – Use real-world examples**

Use real-world examples and case studies to show how your financial data has real-world implications and how it can be used to drive better business outcomes. Use these examples to illustrate key points and to make your story more relevant and engaging for your audience.

✓ **Step 7 – Practice and refine**

Practice your storytelling skills and refine your narrative over time. Solicit feedback from colleagues and other stakeholders to help you improve your storytelling and make your narrative even more compelling.



My biggest technique for a finance story is the 3 W's:

What: Explain the **issue** in all the important aspects (what's the problem, the reasons behind it, the drivers, etc.).

So what: Speak of the implications and the **consequences** (current impact and future impact).

Now what: Prepare the field for the **next steps**. You can either use your business acumen and try coming up with a **recommendation** or you can simply take the role of the discussion facilitator. The goal here is to make sure there is a next step, not that you decide on your own."

Soufyan Hamid, Finance Presentations Coach at SouFBP

How to structure your data visualization story for maximum impact

Structuring your data visualization story properly is crucial to ensure your audience understands your key message and takes the desired action. A well-structured story can help you connect with your audience, convey complex information in a simple and memorable way, and inspire action.

To structure your data story effectively, start with a clear and concise message summarizing the main point of your story. This should be the guiding principle informing the rest of your story and helping you to stay focused on your key message.

Once you have your key message locked down, it's time to think about the overall structure of your story. This means deciding on the order you'll present the information and the types of data visualization techniques you'll use to illustrate your points.

One effective way to structure your data visualization story is to use a narrative arc that includes a beginning, middle, and end:

- 1. The beginning sets the scene and introduces the key players and context.**
- 2. The middle presents key information and data that supports your message.**
- 3. The end summarizes the main points and calls to action.**

Another effective way to structure your data visualization story is to use a pyramid structure, where you start with the most important and impactful information at the top and work your way down to the supporting details.

In summary...

To structure a powerful data visualization story, follow these five steps:

1. **Setting the stage**
2. **Presenting the problem**
3. **Showcasing the data**
4. **Highlighting key insights**
5. **Offering a conclusion or recommendation**

Bonus tips on using financial data to create a compelling story/narrative

1. **Use relatable examples:** Connect your data to real-world situations or familiar concepts to help your audience understand its significance.
2. **Focus on the human element:** Whenever possible, emphasize how your data impacts people – whether it's customers, employees, or stakeholders.
3. **Create an emotional connection:** Engage your audience's emotions by highlighting the potential consequences or benefits of the insights derived from your data.

How to build a persuasive argument

When presenting a data story to an audience, such as the CEO and other stakeholders, it's essential to be prepared for some backlash. This is because financial data can be complex and difficult to understand, and stakeholders may have various interpretations of the data or different priorities and goals.

Resist the urge to jump on the defense. Instead, learn to build a persuasive argument with your financial data storytelling. This means presenting data clearly and concisely and fine-tuning the story so it's relevant to the audience's needs and interests. It also means being able to anticipate potential objections or questions and having a plan to address them.

Building a persuasive argument with data storytelling requires a combination of technical expertise and communication skills.

Telling a story that connects with your audience on an emotional level requires the ability to use storytelling techniques such as analogies, metaphors, and examples to make the data more relatable and engaging.

Ultimately, building a persuasive argument with data storytelling is about translating complex financial information into a clear and compelling story that drives better business outcomes.

By anticipating potential objections and building a strong narrative that resonates with your audience, you can build trust, credibility, and influence, even in the face of potential backlash.

4 tips to create a persuasive argument with financial data

1. Use data to support your claims

Present concrete evidence that reinforces your argument and establishes your credibility.

2. Address potential counterarguments

Anticipate objections or alternative interpretations of the data and address them in your visualizations.

3. Keep it simple and focused

Avoid presenting too many data points or arguments at once, as this can dilute your message and confuse your audience.

4. Make a clear call to action

Guide your audience toward the desired outcome by offering a clear, actionable recommendation based on data-driven insights.

Presentation skills

Even the most compelling financial data story can fall flat without effective presentation skills.

Here are some tips to help you shine during your presentations:

1. Practice, practice, practice

Rehearse your presentation to build confidence and ensure a smooth delivery.

2. Engage your audience

Involve your audience by asking questions, soliciting feedback, or encouraging discussion. This will help keep them engaged and invested in your story.

3. Use storytelling techniques

Embrace storytelling techniques such as pacing, tone, and suspense to make your presentation more engaging and memorable.

4. Prepare for questions

Anticipate the questions your audience may have and be ready to address them with confidence and clarity.

5. Use visuals effectively

Ensure that your data visualizations are clear and concise and use them to support your narrative. Avoid cluttering your slides with too much text or unnecessary visuals.

6. Be mindful of body language

Maintain eye contact, stand tall, and use gestures to emphasize key points. Your body language can convey confidence and enthusiasm, which will help to create a strong connection with your audience.

Chapter 5:

Advanced data visualization techniques

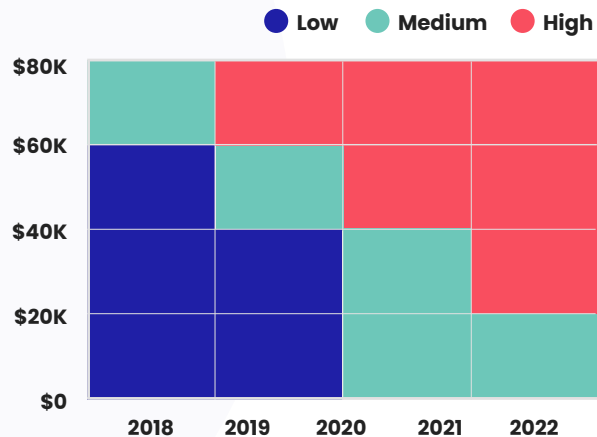
A few advanced techniques to consider

Now we're going to look at some slightly more advanced techniques for data visualization. These techniques help reveal hidden patterns, trends, and relationships in the data, making it easier to make data-driven decisions. They're best suited for individuals with a strong understanding of data analysis and visual design principles.

Below, we explore some of these advanced techniques, along with their difficulty levels (*rated on a scale of 1 to 5, with 5 being the most difficult*).

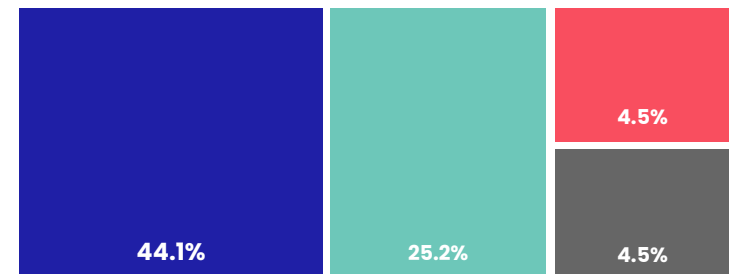
Heatmaps (Difficulty: 2)

Heatmaps use color to represent data values in a matrix format. They're great for identifying trends and patterns in large datasets, such as stock price fluctuations or correlations between various financial indicators. The difficulty in creating heatmaps lies in choosing the right color scheme and scaling.



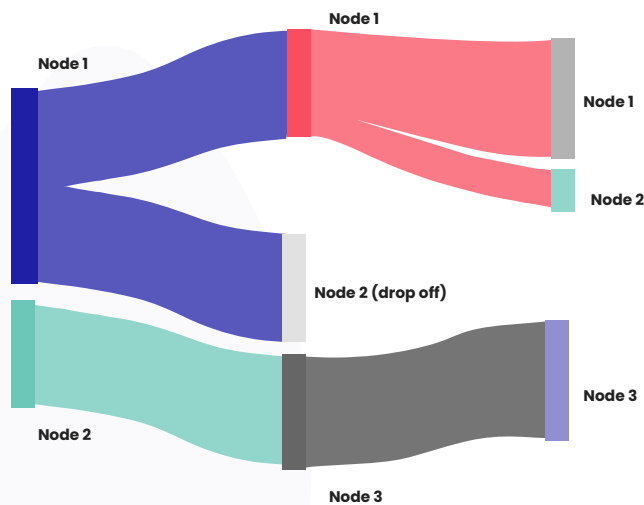
Treemaps (Difficulty: 3)

Treemaps are a space-filling visualization technique that uses nested rectangles to represent hierarchical data. They're useful for displaying financial data with multiple levels, such as the breakdown of a company's revenue by product category and subcategory. The difficulty in creating treemaps involves selecting appropriate nesting and color-coding schemes to ensure clarity.



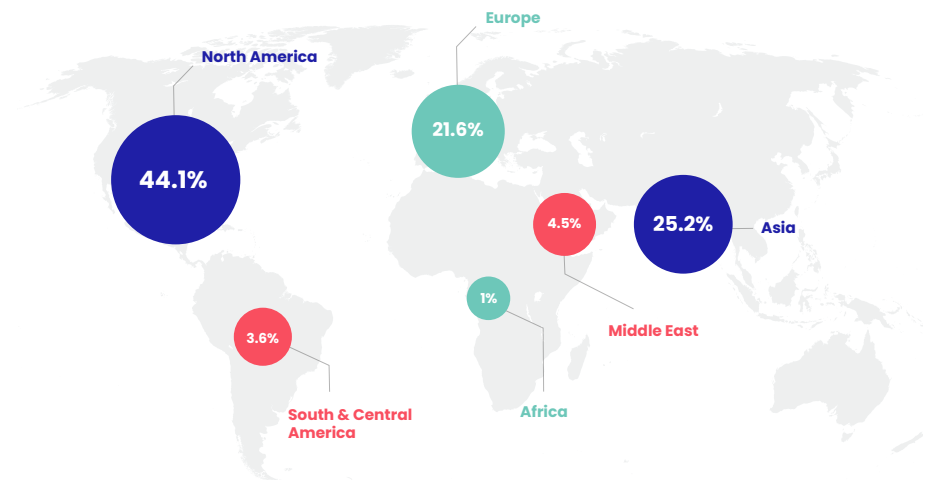
Sankey diagrams (Difficulty: 3)

Sankey diagrams are flow diagrams that show the flow of data or resources between nodes, using the thickness of the connecting lines to represent the flow's magnitude. They're useful for visualizing financial flows, such as the movement of funds between accounts or the distribution of investments in a portfolio. The challenge in creating Sankey diagrams comes from managing the layout and line thicknesses to accurately represent the data.



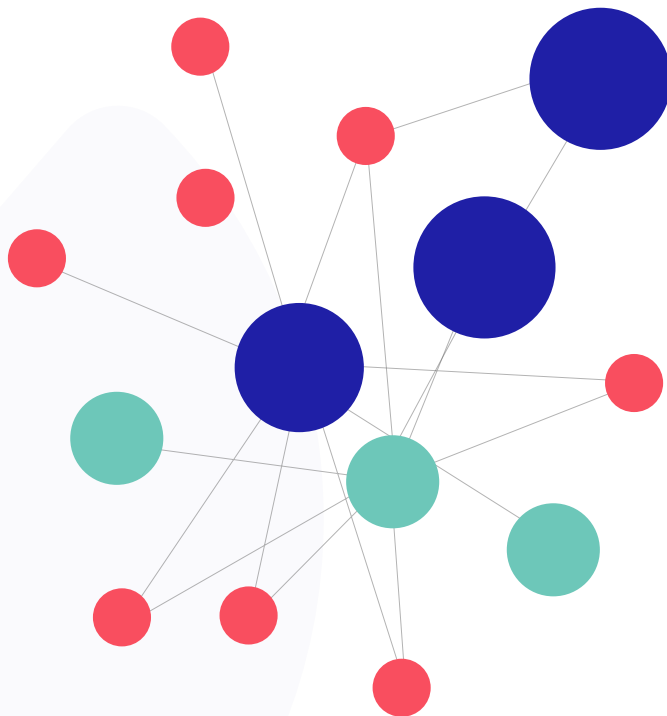
Choropleth maps (Difficulty: 3)

Choropleth maps use color gradients to represent data values across geographical regions, such as countries or states. They're ideal for visualizing regional financial data like GDP growth, poverty rates, or market penetration. The difficulty in creating choropleth maps lies in selecting the right color scheme and ensuring the data is accurately represented geographically.



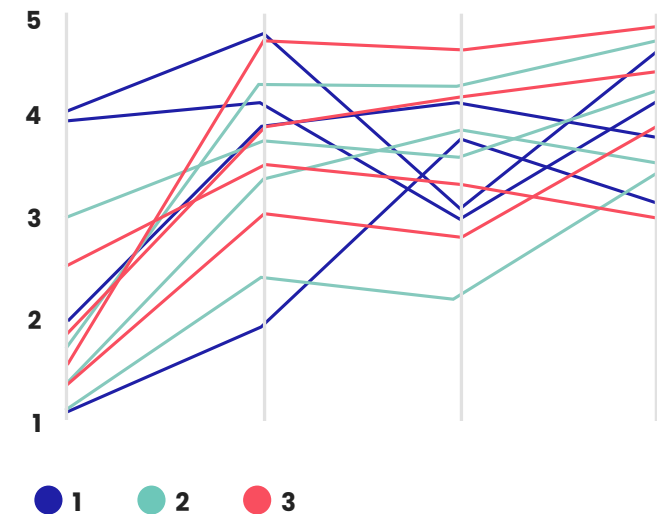
Network graphs (Difficulty: 4)

Network graphs display relationships between entities through nodes and edges. They're ideal for visualizing connections in large datasets, such as relationships between companies, investors, or assets. The difficulty in creating network graphs comes from dealing with large amounts of data and ensuring the visualization remains readable.



Parallel coordinates (Difficulty: 4)

Parallel coordinates plot multivariate data on parallel axes, which allows for the comparison of multiple dimensions simultaneously. This technique is useful for visualizing relationships between different financial variables or analyzing the performance of multiple assets. The challenge lies in managing axis spacing, scaling, and labeling, while maintaining readability.



Animations in data visualizations

Using animations in data visualizations can be an effective way to add a dynamic element to your presentations, making them more engaging and helping to communicate changes in data over time.

Animations can also be useful for illustrating complex concepts and revealing hidden patterns that may be difficult to spot in static visualizations.

Here are some points to consider when incorporating animations in your data visualizations:

1. Is it worth the effort?

Animations are particularly valuable when you need to demonstrate changes in data over time, transition between different states, or provide an interactive experience. However, it's important to use animations judiciously; if overused or applied inappropriately, they can distract from the main message or make the visualization harder to understand.

2. Techniques

There are various ways to incorporate animations in data visualizations, such as:

- Transitioning between different views of the data to highlight specific insights.
- Using animated charts to show changes in data over time (e.g., a line chart or bar chart that updates as time progresses).
- Incorporating interactive elements, allowing users to explore the data and see how the visualization responds to their input.

3. Tools

Several data visualization tools and libraries support animations, including Tableau, D3.js, and Plotly. These tools offer built-in animation features, making it easier to create and customize dynamic visualizations.

5 tips when using animation in data storytelling

To ensure that your animated data visualizations are effective and engaging, keep these best practices in mind:

1. Keep it simple

Use animations to enhance the understanding of your data, not to confuse or distract the audience. Avoid using overly complex or flashy animations and focus on those that help convey the message clearly and succinctly.

2. Prioritize clarity

Make sure the animated elements of your visualization are easy to follow and understand. It's essential to strike a balance between visual appeal and clarity so that your audience can quickly grasp the insights you're trying to convey.

3. Optimize for performance

Animations can be resource-intensive, especially when dealing with large datasets. Ensure that your visualizations are optimized for performance to prevent slow loading times or choppy animations, which can negatively impact the user experience.

4. Test on different devices and platforms

Since your audience may access your visualizations on various devices and platforms, it's essential to test your animations to ensure they work as intended and maintain their impact across different environments.

5. Provide context

Use annotations, legends, or labels to provide context for your animated visualizations. This will help your audience understand what they are seeing and make it easier for them to interpret the data.

Chapter 6:

Accessibility and inclusion

Accessibility and inclusion should be at the forefront when creating financial data stories using visualizations. Ensuring your work is accessible to a diverse audience, including individuals with disabilities or varying levels of expertise, is crucial.

Here are a few things to consider so your visualizations can be enjoyed and understood by everyone:

Colors and contrast

Use colors and contrast levels that are easily distinguishable for individuals with color vision deficiencies or low vision.

Avoid color combinations that may cause difficulties, such as red-green or blue-yellow. Consider using tools like ColorBrewer or WebAIM's Color Contrast Checker to test and optimize your color choices.

Text and font size

Use clear, easy-to-read fonts and maintain an appropriate font size for readability. Try to stay away from using small text, decorative fonts, or overly stylized typography that may be difficult to read for some users.

Alternative text and descriptions

Provide alternative text (alt-text) and descriptions for visual elements, such as charts, graphs, or images. This ensures that screen readers can interpret your visualizations for users with visual impairments.

Clear language

Use simple, concise language that's easy to understand for people with varying levels of expertise or for whom English may not be their first language. Avoid jargon or technical terms that could be confusing.

Keyboard navigation

Ensure that your visualizations and interactive elements are accessible via keyboard navigation. This helps users who may not be able to use a mouse or touchscreen due to physical limitations or visual impairments.

Responsive design

Implement responsive design principles to make sure your visualizations display correctly on various devices and screen sizes, including mobile devices and tablets. This ensures a consistent user experience for everyone, regardless of their preferred device.

Audio and video accessibility

If your data storytelling includes audio or video content, provide captions or transcripts to ensure accessibility for users who are deaf or hard of hearing. Consider adding audio descriptions for users with visual impairments as well.

Test with accessibility tools

Use accessibility tools, such as screen readers or browser plugins like WAVE or axe, to test your visualizations and identify any potential accessibility issues. This will help you identify and address problems before they affect your users.

Provide multiple formats

Offer different formats of your visualizations, such as static images, interactive charts, or text-based summaries, to accommodate users with varying preferences and accessibility needs.

Continuous improvement

Regularly review and update your visualizations to ensure they remain accessible and inclusive. Keep up to date with best practices and guidelines, such as the Web Content Accessibility Guidelines (WCAG), to maintain a high standard of accessibility.

Chapter 7:

Tools and technologies



Choosing the right tools and technologies for data visualization is important for crafting compelling visuals that effectively communicate your data insights. There's a wide range of options available, each with its unique features and capabilities.

Liam Boyle, Data Analyst at Future Beauty Labs, was kind enough to share his best recommendations for financial data storytelling tools below:

Every business still uses spreadsheets and well they should, they are powerful beasts. Excel and its contemporaries still allow users an easy way to analyze their data and still offer good visualizations tool.

Tools like Power BI and Tableau have taken visualization capabilities to a new level while also democratizing the ability for users throughout a business to create insightful visualizations and tell the story of their department's data.

PowerBI is my personal preference and I believe it's a natural evolution for Excel users. It offers the user an intuitive suite of tools to bring together different data sources, integrate and tell the story of the full business.

Harking back to knowing your audience and stakeholders, often these people are very busy and, on the move. PowerBI allows you to create mobile-friendly dashboards and "apps" so you can get key data in their hands anytime, anywhere.

Like Excel, it uses Power Query to transform and manipulate data and while it still uses that common language, it is worth spending some time learning some DAX. Data Analysis Expressions (DAX) is Power BI's library of expressions that can be used to build powerful formulas, calculations, and queries of data in related tables.

Datasets can be set to automatically refresh on a schedule that makes sense for the data, be it daily, weekly, monthly, etc. Once fully matured, reports and dashboards can be very low-touch maintenance-wise with alerts in place if refreshes don't occur as planned.

There are lots of free training options out there to get started with PowerBI and Microsoft has forums and guides to help you on your way; LinkedIn and other platforms offer some really effective introductory courses and YouTube is a wealth of tutorials for all aspects including making mobile-friendly dashboards.

Chapter 8:

Evaluating and measuring success

It's important to evaluate and measure the success of your financial data visualizations to ensure they're effectively communicating your insights and meeting your objectives.

Tips to assess the effectiveness of your finance visualizations

1. Define success criteria

Start by establishing clear goals and success criteria for your data visualization project. These may include conveying specific insights, increasing user engagement, or facilitating decision-making. Your success criteria should align with your overall objectives.

2. User engagement

Analyzing user engagement can help you understand how well your visualizations capture and maintain the audience's attention. Metrics to track may include page views, time spent on the visualization, and interaction rates (e.g., clicks, hovers, or other user interactions).

3. Comprehension and retention

Assessing how well your audience understands and retains the information presented in your visualizations is key. You can use surveys, quizzes, or interviews to gather feedback on comprehension and retention. Ask users specific questions about the insights or trends they've identified in your visualizations to evaluate their understanding.

4. User experience

A positive user experience is essential for the success of your data visualizations. Collect feedback on the overall usability, design, and intuitiveness of your visualizations using surveys or user testing sessions. Look for patterns in the feedback to identify areas for improvement.

5. Conversion rates

If your data visualization is designed to drive specific actions or decisions, track conversion rates to measure success. For example, if your visualization is part of a sales presentation, monitor changes in sales figures or the number of new leads generated.

6. Social sharing and reach

For visualizations intended to raise awareness or drive engagement on social media, monitor the number of shares, likes, comments, and other social interactions. High levels of social engagement can indicate that your visualization is resonating with your audience and effectively conveying your message.

7. Benchmarking

Compare the performance of your visualizations to previous projects or industry benchmarks to gauge their relative success. This can help you identify trends and determine if your current visualization strategies are effective.

8. Iterative improvement

Continuously measure and evaluate the success of your visualizations to identify areas for improvement. Use the insights gained from your evaluations to refine your visualizations and improve them over time.

By regularly evaluating and measuring the success of your data visualizations, you can ensure that they are effectively conveying your insights, meeting your objectives, and providing value to your audience.

Remember to be flexible and adaptable, using the feedback and metrics you gather to refine your visualizations and enhance their overall impact.

Chapter 9: **Ethical considerations**

Why does misrepresentation in financial data happen?

Misleading or misrepresenting data in financial data storytelling can be common due to various reasons, ranging from unintentional mistakes to deliberate manipulation. Some factors that contribute to this issue include:

Confirmation bias

People often tend to seek out and interpret data in ways that confirm their pre-existing beliefs or expectations. This can lead to the selective presentation of data or emphasizing certain aspects while ignoring others, resulting in misleading visualizations.

Pressure to deliver results

In the financial sector, there may be pressure to demonstrate positive results or support a specific narrative, which can lead to manipulating data to fit the desired outcome. This can involve cherry-picking data, using inappropriate statistical techniques, or misrepresenting the context of the data.

Lack of expertise

Misleading visualizations can also result from a lack of expertise in data analysis or visualization techniques. This may lead to unintentional errors, such as misinterpreting data, using inappropriate scales, or misrepresenting relationships between variables.

Ambiguity in data

Financial data can be complex and subject to multiple interpretations. Ambiguity in data can lead to different conclusions, depending on the analyst's perspective or assumptions. This can inadvertently result in misleading or misrepresenting data when presenting it to others.

Cognitive biases

Humans are susceptible to various cognitive biases, such as anchoring or availability bias, which can influence the way we interpret and present data. These biases may lead to over or under-emphasizing specific data points or trends, skewing the overall message of the visualization.

Ineffective communication

In some cases, misleading data can be a result of poor communication or design choices. For example, using confusing or unclear visuals, cluttered layouts, or inappropriate chart types can make it difficult for the audience to accurately interpret the data.

Sensationalism

To capture attention or create a more engaging narrative, some data storytellers might resort to sensationalism or exaggeration. This can involve focusing on outliers or extreme cases, presenting data out of context, or using misleading visuals to create a more dramatic effect.

Lack of transparency

In some instances, data may be misrepresented due to a lack of transparency regarding data sources, methodology, or assumptions. Without this information, it's difficult for the audience to evaluate the credibility and accuracy of the presented data.

Why are ethical considerations so important?

Adhering to ethical principles helps ensure the integrity, trustworthiness, and transparency of your work, which is particularly important in the financial sector. Here are some key reasons why ethical considerations are essential:

Trust and credibility

Financial decisions often have significant implications for individuals and organizations. Maintaining ethical standards in data storytelling helps to build trust and credibility, assuring your audience that the information presented is accurate, reliable, and unbiased.

Compliance and regulations

The financial industry is subject to numerous laws and regulations designed to protect consumers, investors, and the stability of the financial system. Ethical considerations in data storytelling ensure that your work complies with these regulations, avoiding potential legal and financial consequences.

Fair representation

Ethical financial data storytelling requires the fair and accurate representation of data. This includes avoiding cherry-picking or manipulating data to support a specific narrative or agenda. Presenting a comprehensive and unbiased view of the data helps your audience make well-informed decisions.

Privacy and confidentiality

Financial data often contain sensitive information about individuals or organizations. Ethical considerations in data storytelling involve protecting the privacy and confidentiality of this information, and ensuring that personal data is anonymized and aggregated as needed to prevent the identification of specific individuals or entities.

Transparency

Ethical data storytelling requires being transparent about the sources of your data, the methodology used to analyze it, and any assumptions or limitations in your findings. This transparency allows your audience to assess the reliability of your work and promotes informed decision-making.

Avoiding conflicts of interest

Ethical financial data storytelling involves identifying and mitigating any potential conflicts of interest that could compromise the objectivity of your work. This may include disclosing any relationships or affiliations that could influence your analysis or presentation of the data.

Social responsibility

Ethical data storytelling acknowledges the potential social and economic consequences of your work. It's important to consider the broader impact of your visualizations and ensure that they don't perpetuate harmful stereotypes, biases, or misinformation.

Continuous improvement

Ethical financial data storytelling involves a commitment to continuously improving your skills and knowledge, staying up-to-date with industry best practices, and refining your work based on feedback and new insights.

How to avoid misleading or misrepresenting financial data in visualizations

To avoid misleading or misrepresenting data in visualizations, it's crucial to adhere to best practices and maintain a strong sense of integrity.

Tips to help create accurate and trustworthy visualizations

Start with a clear objective

Define your goals and what you want to communicate through your visualization. Having a clear objective will help you stay focused on presenting data that is relevant and accurate.

Use appropriate visualization techniques

Choose the right chart types and visual elements that accurately represent the data and relationships between variables. Ensure that the chosen visualization method does not distort the data or imply relationships that don't exist.

Be mindful of scales and axes

Use appropriate scales and axes that provide an accurate representation of the data. Avoid using truncated axes or inconsistent scales, which can exaggerate differences or minimize important trends.

Present data in context

Provide relevant context for the data you're presenting, such as historical trends, comparisons with similar data sets, or explanations for unusual data points. This will help your audience understand the data more accurately and avoid drawing incorrect conclusions.

Double-check your data and calculations

Carefully review your data sources and calculations to ensure that they are accurate and reliable. Mistakes or inconsistencies can lead to misleading visualizations, so it's essential to verify your data before presenting it to others.

Be transparent about data sources and methodology

Clearly state the sources of your data, the methodology used to analyze it, and any assumptions or limitations in your findings. This transparency allows your audience to assess the reliability of your work and promotes informed decision-making.

Avoid cherry-picking and confirmation bias

Present a comprehensive and unbiased view of the data, including both positive and negative trends. Be aware of your own biases and avoid selectively presenting data that supports your pre-existing beliefs or desired outcomes.

Test your visualizations with others

Share your visualizations with colleagues or peers and gather feedback on their interpretation of the data. This can help you identify any potential issues or areas for improvement before presenting your visualizations to a wider audience.

Continuously improve your skills

Stay up-to-date with best practices in data visualization and invest in developing your skills. As you gain more experience and knowledge, you'll be better equipped to create accurate and compelling visualizations.

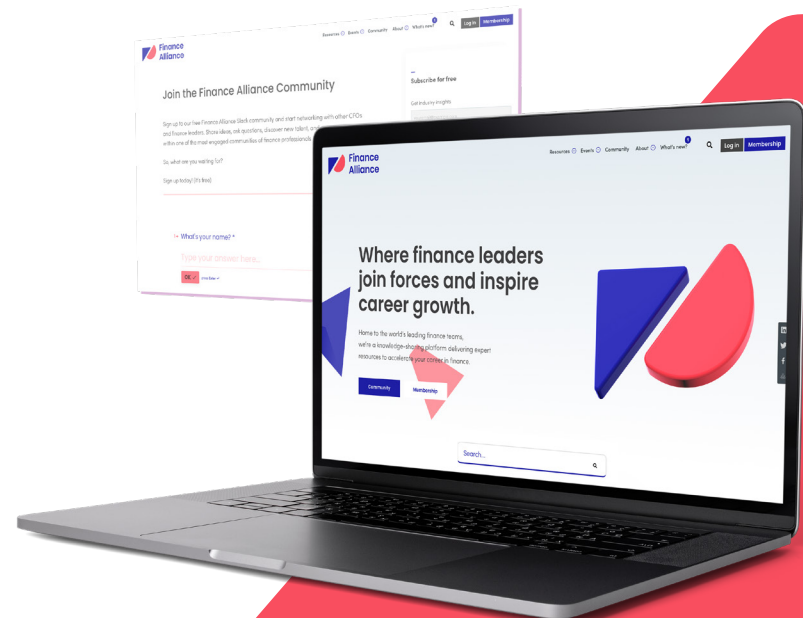
By following these tips and maintaining a strong commitment to accuracy and ethical data storytelling, you can create visualizations that effectively communicate your insights and foster trust with your audience.

Conclusion

As you continue to apply the principles, techniques, and best practices outlined in this playbook, remember the process of mastering financial data storytelling is an ongoing adventure. Embrace the challenges, celebrate the successes, and never stop refining your craft.

The world of finance is ever-evolving, and so too are the ways in which we communicate our insights and findings. Stay curious, stay passionate, and stay driven!

Don't forget to join our free [Slack community](#) for finance professionals like you.



A special thank you to our guest writers...



Soufyan Hamid

Finance Presentations Coach at SouFBP



Liam Boyle

Data Analyst at Future Beauty Labs

Contributors



Richard King

CEO and Founder of Finance Alliance

Rich is the Founder of Finance Alliance and is at the helm of our voyage to elevate finance roles worldwide. He's responsible for what happens next with the community. So, if you'd like to have your say, don't hesitate to get in touch – Rich is always open to invaluable feedback and ideas.



Sabrinthia Donnelly

Senior Copywriter at Finance Alliance

Sabrinthia is our Senior Copywriter here at Finance Alliance and host of the Two Cents: Finance Talk podcast.



Jon Sayer

Graphic Designer

Jon is our graphic designer and looks at all our design requirements. He's responsible for the layout and visual elements in this report and is always happy to hear your thoughts!

