

Data trials and triumphs

Introduction

A data analytics professional's job is to provide the data necessary to inform key decisions. They also need to frame their analysis in a way that helps business leaders make the best possible decisions.

In this reading, you're going to explore the role of data in decision-making and the reasons why data analytics professionals are so important to this process. You'll compare data-driven and data-inspired decisions to understand the difference between them. You'll also check out some examples where projects failed or succeeded based on how the data was applied.

Both data-driven and data-inspired approaches are rooted in the idea that data is inherently valuable for making a decision. Well-curated data can provide information to decision-makers that improves the quality of their decisions. Remember: Data does not make decisions, but it does improve them.



Data-driven decisions

As you've been learning, data-driven decision-making means using facts to guide business strategy. The phrase "data-driven decisions" means exactly that: Data is used to arrive at a decision. This approach is limited by the quantity and quality of readily-available data. If the quality and quantity of the data is sufficient, this approach can far improve decision-making. But if the data is insufficient or biased, this can create problems for decision-makers. Potential dangers of relying entirely on data-driven decision-making can include overreliance on historical data, a tendency to ignore qualitative insights, and potential biases in data collection and analysis

Example of a data-driven decision

A/B testing is a simple example of collecting data for data-driven decision-making. For example, a website that sells widgets has an idea for a new website layout they think will result in more people buying widgets. For two weeks, half of their website visitors are directed to the old site; the other half are directed to the new site. After those two weeks, the analyst gathers the data about their website visitors and the number of widgets sold for analysis. This helps the analyst understand which website layout resulted in more widget sales. If the new website performed better in producing widget sales, then the company can confidently make the decision to use the new layout!

Data-inspired decisions

Data-inspired decisions include the same considerations as data-driven decisions while adding another layer of complexity. They create space for people using data to consider a broader range of ideas: drawing on comparisons to related concepts, giving weight to feelings and experiences, and considering other qualities that may be more difficult to measure. Data-inspired decision-making can avoid some of the pitfalls that data-driven decisions might be prone to.

Example of a data-inspired decision

A customer support center gathers customer satisfaction data (often known as a “CSAT” score). They use a simple 1–10 score along with a qualitative description in which the customer describes their experience. The customer support center manager wants to improve customer experience, so they set a goal to improve the CSAT score. They start by analyzing the CSAT scores and reading each of the descriptions from the customers. Additionally, they interview the people working in the customer support center. From there, the manager formulates a strategy and decides what needs to improve the most in order to raise customer satisfaction scores. While the manager certainly relies on the CSAT data in the decision-making process, input of support center representatives and other qualitative information informs the approach as well.



A data analysis triumph

When data is used strategically, businesses can transform and grow their revenue. Consider the example below.

PepsiCo

Since the days of the New Coke launch, things have changed dramatically for beverage and other consumer packaged goods (CPG) companies.

According to a *Think with Google* article by Shyam Venugopal, PepsiCo “hired analytical talent and established cross-functional workflows around an infrastructure designed to put consumers’ needs first. Then [the company] set up the right processes to make critical decisions based on data and technology use cases. Finally, [it] invested in the right technology stack and platforms so that data could flow into a central cloud-based hub. This is critical. When data comes together, we develop a holistic understanding of the consumer and their journeys.”

In this data-inspired decision, PepsiCo is not just using its own set of data, but also employing external sources to supplement its datasets and expand its market reach. Learn about how PepsiCo is delivering a more personal and valuable experience to customers using data in [How one of the world’s biggest marketers ripped up its playbook and learned to anticipate intent](#).

Data analysis failures

You’ve been learning why data is such a powerful business tool and how data analysts help their companies make data-driven decisions for great results. Using data to draw accurate conclusions and make good recommendations starts with having complete, correct, and relevant data.

Note: It's important to remember that it's possible to have solid data and still make the wrong choices. It's up to data analysts to interpret the data accurately. When data is interpreted incorrectly, that incorrect interpretation can lead to huge losses. Consider the following.

Coke launch failure

In 1985, New Coke was launched, replacing the classic Coke formula. The company had done taste tests with 200,000 people and found that test subjects preferred the taste of New Coke over Pepsi, which had become a tough competitor. Based on this data alone, classic Coke was taken off the market and replaced with New Coke. The company thought this was the solution to take back the market share that had been lost to Pepsi.

But as it turns out, New Coke was very unpopular—and the company ended up losing tens of millions of dollars. The data seemed correct, but it was incomplete: The data didn't consider how customers would feel about New Coke replacing classic Coke. The company's decision to retire classic Coke was a data-driven decision based on incomplete data.

Mars Orbiter loss

In 1999, NASA lost the \$125 million Mars Climate Orbiter even though the teams had good data. The spacecraft burned to pieces because of poor collaboration and communication. The Orbiter's navigation team was using the International System of Units (newtons) for their force calculations, but the engineers who built the spacecraft used the English Engineering Units system (pounds) for force calculations.

No one realized there was a problem until the Orbiter burst into flames in the Martian atmosphere. Later, a NASA review board investigating the cause of the problem discovered the issue was in the software that controlled the thrusters. One program calculated the thrusters' force in pounds; another program working with the data assumed it was in newtons. The software controllers were making data-driven decisions to adjust the thrust based on 100% accurate data, but these decisions were wrong because of inaccurate assumptions when interpreting it. The two teams might have communicated so they picked a single unit of measure, or so the analysts would have known that conversion was a necessary step in the process to prepare the data. A conversion of the data from one system of measurement to the other could have prevented the loss.

There's a difference between making a decision with incomplete data and making a decision with a small amount of data. You learned that making a decision with incomplete data is dangerous. But sometimes accurate data from a small test can help you make a good decision. Stay tuned: You'll learn about how much data to collect later in the program.

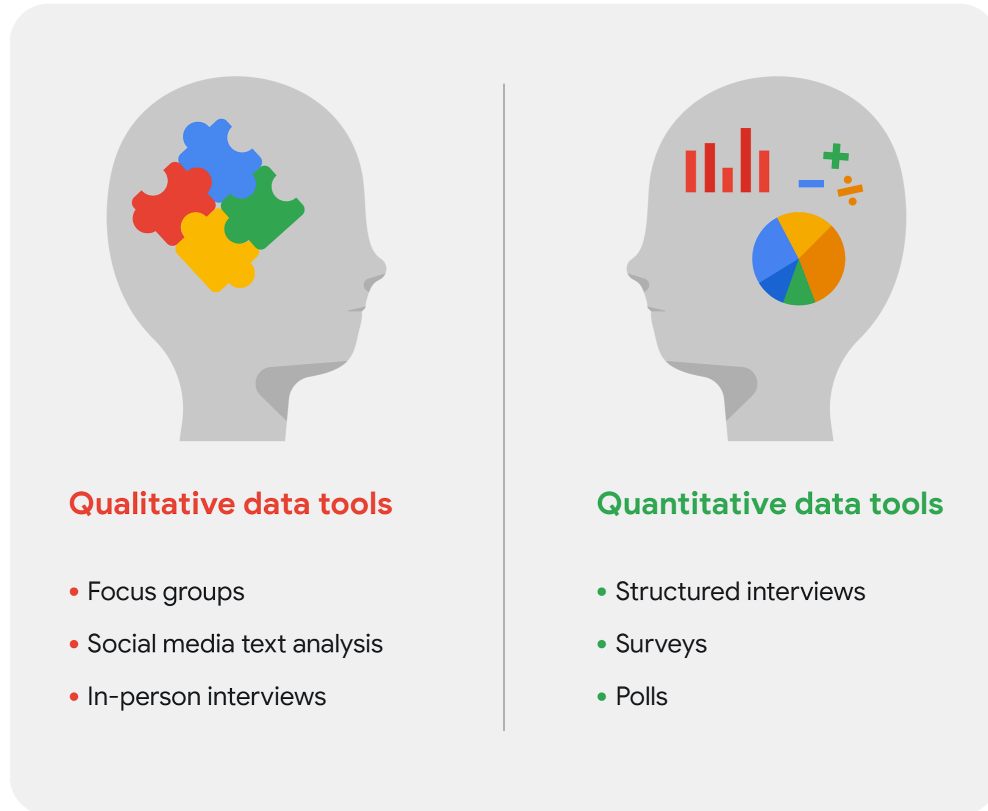
Key takeaways

As a data analyst, you'll rarely need to consider, "Am I being data-driven or data-inspired?" It's helpful to have some context for these two approaches, though your own skills and knowledge will be the most important parts of any analysis project. So, keep a data-driven mindset and ask lots of questions. Experiment with many different possibilities. And use both logic and creativity along the way. Using this approach, you'll be prepared to interpret your data with the highest levels of care and accuracy.

Qualitative and quantitative data in business

This reading further elaborates on the meaning of **qualitative** versus **quantitative**.

As you have learned, there are two types of data: qualitative and quantitative.



Qualitative data tools: focus groups, social media text analysis, and in-person interviews

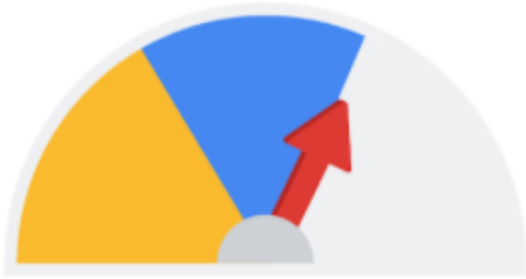
Quantitative data tools: structured interviews, surveys, and polls

Now, take a closer look at the data types and data collection tools. In this scenario, you are a data analyst for a chain of movie theaters. Your manager wants you to track trends in:

- **Movie attendance over time**
- **Profitability of the concession stand**
- **Evening audience preferences**

Assume quantitative data already exists to monitor all three trends.

Movie attendance over time



Starting with the historical data the theater has through its loyalty and rewards program, your first step is to investigate what insights you can gain from that data. You look at attendance over the last 3 months. But, because the last 3 months didn't include a major holiday, you decide it is better to look at a full year's worth of data. As you suspected, the quantitative data confirmed that average attendance was 550 per month but then rose to an average of 1,600 per month for the months with holidays.

The historical data serves your needs for the project, but you also decide that you will resume the analysis again in a few months after the theater increases ticket prices for evening showtimes.

Profitability of the concession stand



Profit is calculated by subtracting cost from sales revenue. The historical data shows that while the concession stand was profitable, profit margins were razor thin at less than 5%. You saw that average purchases totaled \$20 or less. You decide that you will keep monitoring this on an ongoing basis.

Based on your understanding of data collection tools, you will suggest an online survey of customers so they can comment on the food at the concession stand. This will enable you to gather even more quantitative data to revamp the menu and potentially increase profits.

Evening audience preferences



Your analysis of the historical data shows that the 7:30 PM showtime was the most popular and had the greatest attendance, followed by the 7:15 PM and 9:00 PM showtimes. You may suggest replacing the current 8:00 PM showtime that has lower attendance with an 8:30 PM showtime. But you need more data to back up your hunch that people would be more likely to attend the later show. Evening movie-goers are the largest source of revenue for the theater. Therefore, you also decide to include a question in your online survey to gain more insight.

Qualitative data for all three trends plus ticket pricing

Since you know that the theater is planning to raise ticket prices for evening showtimes in a few months, you will also include a question in the survey to get an idea of customers' price sensitivity. Your final online survey might include these questions for qualitative data:

1. What went into your decision to see a movie in our theater today? (movie attendance)
2. What do you think about the quality and value of your purchases at the concession stand? (concession stand profitability)
3. Which showtime do you prefer, 8:00 PM or 8:30 PM, and why do you prefer that time? (evening movie-goer preferences)
4. Under what circumstances would you choose a matinee over a nighttime showing? (ticket price increase)

Key takeaways

Data analysts will generally use both types of data in their work. Usually, qualitative data can help analysts better understand their quantitative data by providing a reason or more thorough explanation. In other words, quantitative data generally gives you the what, and qualitative data generally gives you the why. By using both quantitative and qualitative data, you can learn when people like to go to the movies and why they chose the theater. Maybe they really like the reclining chairs, so your manager can purchase more recliners. Maybe the theater is the only one that serves root beer. Maybe a later show time gives them more time to drive to the theater from where popular restaurants are located. Maybe they go to matinees because they have kids and want to save money. You wouldn't have discovered this information by analyzing only the quantitative data for attendance, profit, and showtimes.