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THE IoA GUIDE TO DATA CULTURE CHANGE

The Institute of Analytics (IoA) is a global professional membership body for the analytics & data science community. We're a not-for-profit organisation.
Our mission is to develop and promote the highest professional and ethical standards, create awareness of the value of data analytics and its uses in society and inspire the next generation of analysts & data scientists through education.
We help our members stay ahead of the curve of digital transformation through access to benefits including training and upskilling, updates about advancements in technology and regulation, masterclasses and thought leadership.

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Introduction

Back in the 1990s, when communication went digital, everyone was forced to get over any discomfort of using communications technologies such as emails and mobile phones.

Now we are faced with a similar dilemma as decision making is going digital. Many people may feel uncomfortable with decision technologies that support or even automate decision making, but we're left with little choice other than to learn to work with them or get left behind.

Looking at the most successful global companies, you can see the competitive advantages that come from working with data. Analysts can provide insights by scanning vast data sets too big for manual inspection, pulling out patterns in the data that can support amazing decision making. They can also delegate at least part of a process that involves routine decision making to machines, freeing up staff time to focus on innovation projects that have been put off for months.

Human-machine teaming can feel alien when you first start working with machine insights as it requires a major change in the way we both think and work.

Cultural change is never easy but it's possible. We've compiled this guide to support you in transforming the culture wherever you work.

Dr Clare Walsh
IoA Director of Education

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Section 1:
Dealing with naysayers

Knowing the attitudes you need to overcome may help you spot the warning signs of trouble ahead.

1. The person still clinging to historical reporting

Using data to report on historical sales, market performance or staff retention rates is familiar to all of us today. The technology that made the compilation of spreadsheets for analysis a common part of business life was introduced in the 1990s. The problem is that we've become a little too accustomed to viewing reports on past performance and using data to evidence that we already made the right decisions.

"I suggested we move into the Turkish market, and here are the new sales figures to show that it was a great idea"

Today, we need to use data to support making better decisions in the first place. We look at the data and then make our decision, rather than being overly reliant on hunches or intuition. Studies have consistently shown that people who work with data in making decisions on the whole make better decisions.

Task

List some of the charts that your company regularly produces. How are they used in the decision making process? Who has decision making power? How are decisions taken?

2. The person with their fingers in their ears

Some people just want this interest in data to blow over and let them carry on with their work as they did before. Many people said the same thing about communications technologies 30 years ago, but today internet and mobile phone use is almost universal. Overall, companies will be able to improve decision making and reduce operational costs by automating, and the interest in data shows no signs of just going away.

Task

List the ways that your organisation has benefited from the revolution in communications technologies. What would have happened to your company if you'd refused to embrace those technologies?

Think about how data might help you. Ask colleagues to list some insights that they would like about their specific area of the business. It might seem impossible to get that information now, but a data scientist might think differently.

3. The person who wants to re-invent everything in Excel

Anyone who has attended school since 1987 will know their way around an Excel file. Excel is where we all began, and it's an almost ubiquitous tool these days.
With success come other challenges though. Its design pre-dates the online world.

It was always intended to carry out one-off exploratory analysis. Modern analytics are about rapid tracking of updates. Ten years ago, a limit of half a million rows seemed reasonable, but not today. Excel is user-friendly but whilst it does a lot of things on your behalf, it also does things like delete any rows that go beyond the maximum without giving you an error code. And try getting your photo library into Excel and analysing it. Version control is also a big issue. With any downloaded tool, several people may have various rogue copies of data sets sitting on their laptop which they have added to, deleted or changed either intentionally or unknowingly. A lot of these easy point and click tools are also based on 20th century mathematics and cannot process the radically different mathematics of machine learning. Excel is great at Excel-type tasks, but 'data' means so much more today than it did in 1987.

Task

Think about why you continue to use Excel. Have you considered the payoffs? What might be the limitations of sticking to just one tool?

4. The person who wants to leave it all to the data scientist to work their magic

For many people, the world of data science seems impenetrable. We want to be able to leave it all to the experts and wait for them to tell us what to do. In our mind, we have a specific problem to solve:

For a data scientist, this means nothing. They need clearly defined problems and mutual agreement on what success looks like. Reaching agreement on this is not easy. The current challenge is to learn how to supervise the humans and the machines on your team. Your job is to make sure that the most sensible voice is heard, and that means you need to know how to challenge machine decisions, just as you would anyone else on the team.

Task

List a range of roles in your organisation e.g. your warehouse, customer service advisors, senior leadership. How might they make decisions each day using machine insight? They may not need to handle data tables, but what is the minimum amount of information they need to work effectively with output? For example, your warehouse staff need to know how to challenge clearly incorrect stock control data or they might have input on better stock layout that machines could test.

5. The person who always jumps on the hype bandwagon

Waiting for this data phase to blow over is a high-risk strategy. Working with experimental technologies also incurs a high level of risk as well. If you want data to support this, look at the failure rate of tech startups. The economics of startups are entirely based on the assumption that most will fail.
Assuming you work in an established organisation with legacy systems, some useful knowledge of your field and a reputation to protect, you probably want to be working somewhere in the middle of naysayers and trend surfers.

Task

Look at the chart below which represents the diffusion of innovation. Depending on how strong a role technology plays in your company, where is the comfortable spot on this curve for you? If you want to stay, for example, among the early majority, how often do you think you need to review your policy on data use to keep up? How do you stay ahead of changes in the data field to ensure that you're not falling behind?

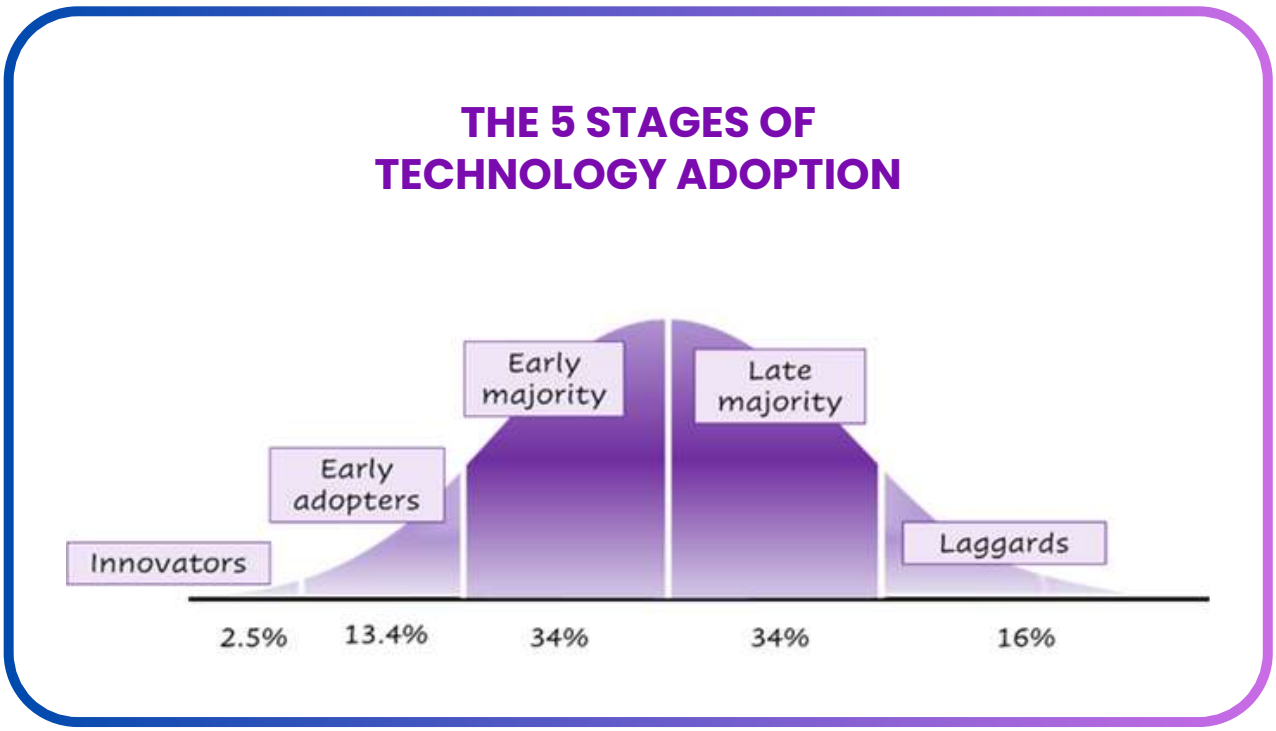


Figure 1: Diffusion of Innovations, Everett Rogers

6. The person who thinks that there are techie types and business types, and you can't be both

What do Steve Jobs, Mark Zuckerberg and Bill Gates have in common? They are all highly technical and also excel at business.

There is very little evidence that business savvy and technical skill are mutually exclusive, but this false stereotype runs deep. If we were to distribute the qualities of technical skills and business skills across the population in a scatter plot, we would see an even distribution with no noticeable correlation. The dots would be everywhere.

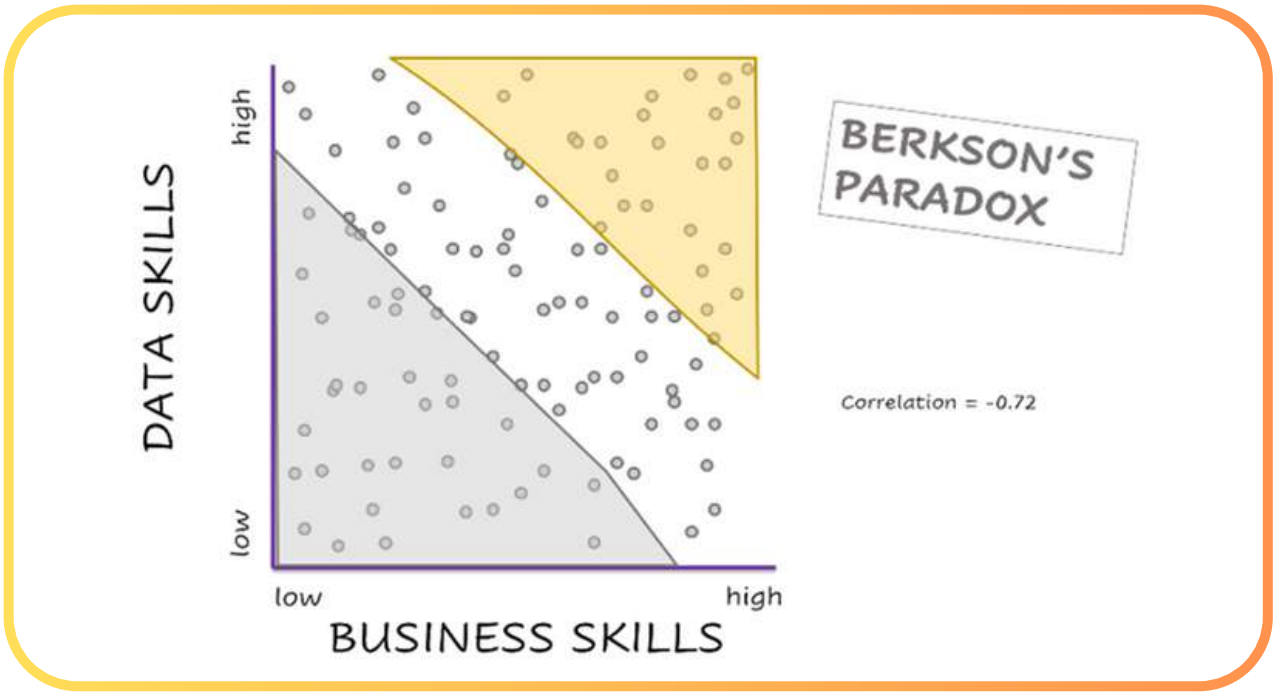


Figure 1: Diffusion of Innovations, Everett Rogers

But we don't come across the entire population in our working lives. The dots blocked off with grey are the people who have neither tech nor business skills; these are people you are unlikely to be working with. Whereas the golden triangle is the preserve of the likes of Elon Musk and Jeff Bezos, who aren't applying for jobs in other companies anytime soon.

In the dots that are left in the middle, we can see the pattern goes downwards, meaning that the better you are at business, the less likely you are to also be good at data and vice versa. This is called Berkson's Paradox and it explains the persistence of the 'geek' stereotype. People, in general, can be skilled at business and data in equal measure, but the people you are more likely to meet might not be.

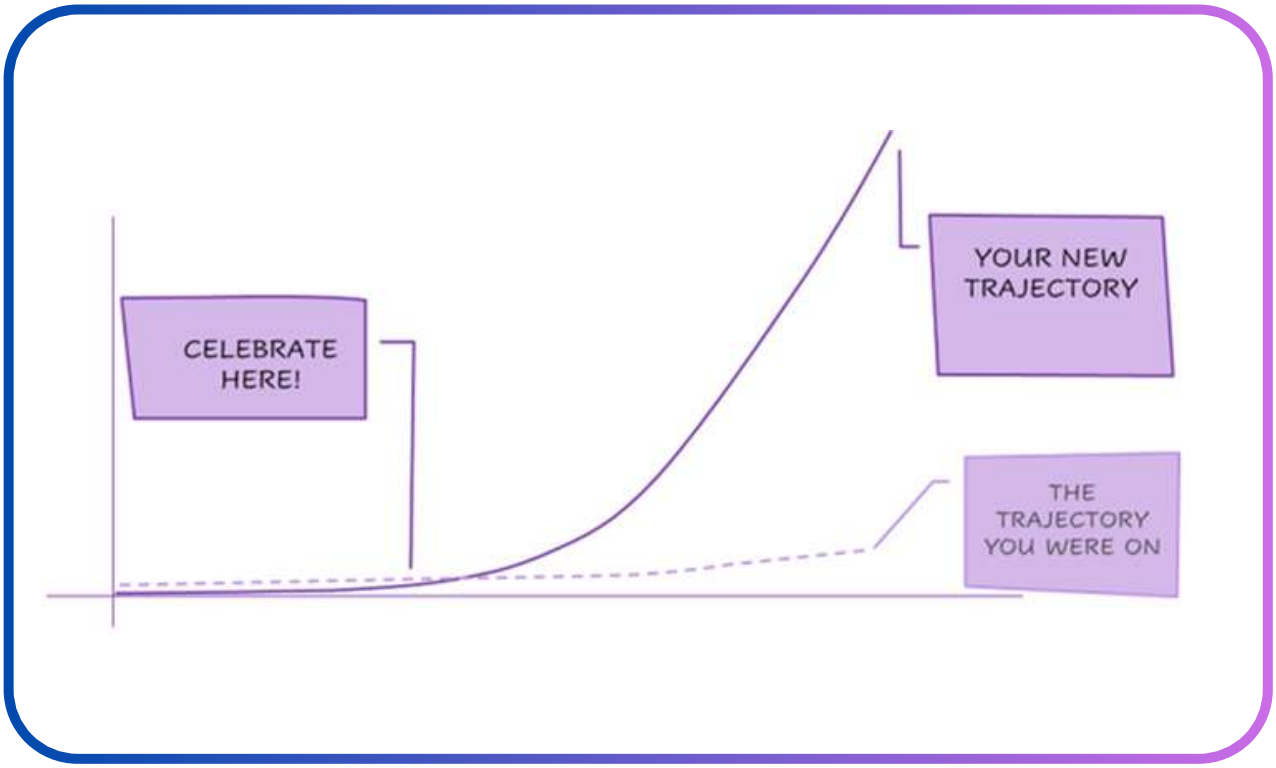
Task

Ask some of your colleagues to self-assess their talents in these two fields. If they feel that they are weak in one area, was it that somebody told them that they're not good? Often this goes all the way back to school. What if they believed that they could be good at both? Where could they experiment with a new technology or business process to test out their perceived lack of skills?

Section 2:
How do we change?

Your data literacy upskilling can only go as fast as your least data-literate colleague, so you need to look at bringing everyone on board within the organisation. There is no one magic formula for this, but below are our best tips to make a positive start.

1. Reward the first baby steps



Your job is not to complete your staff's data literacy training, but to get everyone onto a better trajectory. Making that first move to try a new tool is enough to get you on the trajectory of new possibilities. Asking to see data before making a decision gets you on a better trajectory. Small steps make big changes over time. It takes courage for your colleagues to feel like they belong in this new data world. Reward those early, tentative steps and let the magic of trajectories take over for you.

Task

Create a set of bingo cards with tasks that you would like everyone to learn. You may have pressing needs, but you also might like to keep it simple and very low stakes to begin with such as:

- Describe how Candy Crush data supports gameplay
- Carry out a fun survey and present the results in a report
- Create a report to help people better estimate their chances of winning the lottery

Give one bingo card to a team. They can mark off items on their bingo card when a team member completes that task. Create a system of publicly celebrating the progress.

2. Appoint a Data Oracle

People are going to have questions, a lot of which will be practical.

"I'm not sure I know what I'm doing here"

"I'm terrified about being replaced by a machine"

Those gaps, fears and concerns will be bubbling up. You don't want these kinds of questions being discussed around the water cooler. If you have a Data Oracle ready to deal with questions, people will feel safer.

Task

List a few people who could become Data Oracles. What do you need to support them? What will be the process for handling questions that the Data Oracle can't answer?

3. Create a data catalogue and share it

You work with amazing people who are all performing their roles professionally. They will be able to see a use for your data that you can't see. That, in turn, might get them excited about the possibilities of data and how they can use it. We all respond well to a sense of control.
Collate some human-friendly schemas for your different data sets (this is not the place to show off your XML best standards compliance). List a few suggestions of open data sets that you think might also be relevant such as map data, weather data or traffic data. Then share it and see what happens.

Task

Ask colleagues to brainstorm all the possible stakeholders (colleagues, clients and suppliers or the wider business community that you operate in). This is an easier place for most people to start. Then ask for suggestions of all potential uses. Share the fact that not everyone's suggestions will be acted on, but they will all be reviewed.

4 Approach it like a marketing task

If you wanted to sell a product or a service, you would get one of the marketing team to run a campaign. You need a data culture upskilling campaign! Your marketing team may have ideas on running promotions around the company or organising events such as a data pub quiz or a 'lunch and learn'. Make a social media campaign. Dabble in behavioural psychology by considering rewards.

Task

Before you speak to marketing, set yourself some benchmarks for success. How many people would you like to attend your event? Could you do an exit survey? Can you write up a report to share on your newsletter and pique everyone's interest? What photos can you use?

5 Find ambassadors outside of the data team

There is nobody better at enthusing about a data process than a person who has just learnt to use a tool that has removed the most tedious parts of their work. Trust us, not even you, the data aficionado, can match their levels of happy surprise. They are fresh and full of wonder; only a few weeks back they also were probably on the other side of the 'should we upskill' debate. All of this works in your favour.

Task

Find that person in your organisation! If you have no initial use cases to promote, send out a staff survey for volunteers to try something new in data. When you have a couple of successes under your belt, more will follow. Don't discount anyone at this stage. We all need to learn!

6. Sell data upskilling as part of data security

The statistics on the increase of cyber attacks have been a horror show in recent years. It will always be safer to bring the people to the data, not take the data to the people. Once people download data and analyse it on their laptops, it comes with additional risks. Carrying out analytics on a server is only a few steps further down the analytics skills path, and cloud service providers have significantly more cybersecurity expertise to fall back on. If it's on the cloud, it's safer.

Task

Carry out a quick survey of what data people have on their laptops. Does it have the appropriate security measures? Have they kept their schema and records of data cleaning up to date? How are they managing version control? "We believe we have secure practices because we haven't had any problems yet" is not a very robust approach to modern cybersecurity.

7. Crush the scope to get up and running

The days when data scientists could ask for half the company's research and development budget have long gone. Always start modestly with your data projects. You should expect to get up and running, showing at least potential return on investment, within 3 months.
Your job is to win your colleagues over with a list of your data achievements. The quicker that list grows, the easier your job will be.

Task

Make a decision chart like the one below to support your next steps. Prioritise the quick, inexpensive wins that support your main mission as a company and key strategic goals.

Problem	Solution	Complexity	Time scale	Cost	Alignment to strategic goals
We don't know enough about our customers	Customer segmentati-on with email data	Analyse email text for insights Clustering and text analysis are within our skill set	1 month	$	Strong
	Create a loyalty scheme to track interactions and carry out graph network analysis	Challenging to store the data Incomplete data (what if they're not a customer?) Large distributed data set needed Requires marketing	2 years from inception to uptake and insights; dependent on uptake	$$$$$$	Strong

8. Stop enabling poor practice

There will be times when one of your colleagues will ask you one of the following:

"Could you just get me the data on ...?"

"Could you just build me one of those dashboards?"

Unless the person making the request is very senior, consider what they're asking you to do. They could build their own dashboard with the right tool and a 4-hour training course. They could pull any data they wanted if they invested a couple of hours learning SQL. Sometimes the correct answer is, simply, No. Instead, give your colleagues everything they need to learn and your contact details in case they need help, and then sit back. If you select the task wisely, they will manage it and feel empowered by having this new skill under their belt.

Task

Prepare for these kinds of requests. Get a 'welcome pack' ready with an introduction sheet for the tool, and where to locate tools, support, etc.

9. Never infantilize your colleagues

It's important to recognise that although we bring great insight, by viewing the world mathematically, there is a wealth of information we cannot possibly capture in our data sets. We do not have all the answers. Talking about 'data literacy' training may offend colleagues – nobody wants to be labelled illiterate. There are plenty of alternative ways to talk about the good work we could be doing.

- Talk about decision making and how your data supports better decisions.
- Support the roles that people play in the company. Most employees' sense of value to a company comes from their roles, so show them that they can do that role better..

- Start sending some data in a timely or effective manner, such as sales data at a granular level or with greater recency, and then wait to see if it's appreciated.
- Talk about risk regularly. We are all adept at predicting success, but we tend to ignore the risks that we are taking. A safe environment to discuss change can help adoption.

Task

Any time you plan to share your wisdom, run it past another person to check that it doesn't alienate your target audience. Swallow your pride and find a better way to share your knowledge.

10. Look for no-code, low-code solutions

At the Institute of Analytics, you are among friends. We get it. Your life would be so much easier if everyone learnt just a little SQL or Python. Like you, we can already picture the amazing constructive conversations we could all be having! Not everyone shares this view, though. Where possible, look for no-code, low-code solutions or point-and-click tools.

A new generation of young people are coming through the education systems; graduates who have all learnt a little coding at school. But until they make up the bulk of staff in offices, we may need to take baby steps. If a point-and-click tool is in their comfort zone, then start working with that.

Task

Most tools, like Excel, will have 'expressive language', in other words an option to type the command instead of highlighting, dragging or clicking. Can you put posters up showing how clicking on a button might be expressed in words? Can you share a quiz with your colleagues to match written commands to point-and-click functions? If less tech-literate colleagues can make connections between new and old ways, they will feel more in control.

Section 3:
How will you know it's working?

You need to identify some short, mid and long-term outcomes that you can measure. Proxies for growing data capabilities might include:

- Sign-ups on courses or completion rates
- A growing list of data solution projects
- Cost savings or increased profit

We have a few signs that you are on the right track:

1. Your data specialists are spending more time listening to people than selling your services

When people start to request your help, explain their problems and ask for your advice, you can be sure that your data culture transformation is on the right trajectory.

2. People are challenging your work more

If your colleagues start asking about the limitations or nuances in the figures that you've produced, start challenging you about where you got the data from or how it was sampled, or if they want to know more about your cleaning process etc, these are all very strong signs that you're winning.

3. The quality of your data is improving

Data that is permanently at rest and never accessed can stew and simply becomes digital clutter. Nobody will ever notice because nobody cares. If you start getting complaints about your data quality and you start making improvements in response, it's a sure sign that your data is out there and getting used, and that is a good thing.

4. Your work gets credited regularly

Sales and marketing teams are experienced in taking credit for their work… and possibly yours too. Sales staff will report that an increase in sales came from their excellence. Operational managers will boast of cost savings.
If much of the success of the sales team was because Jenny from analytics got the right data, or if the cost savings came from Dewayne's work to automate, you need to get in the habit of shouting it out. Do it often enough, and people will start to see that the data capabilities are behind positive changes.

5. People stop clinging to specifics

The first time you explain what a clustering algorithm is, your colleagues will see everything as a clustering problem. The first time you explain false positives and false negatives, your audience will discuss false positives and false negatives, completely overlooking any other problems with the results, like outdated data or sampling bias. It's normal to focus on what you've just learnt. Once people stop clinging to specifics and approach the use of data with a broad range of concerns and questions uppermost in their minds, it's a sign that they understand the nuanced complexities of this field.

6. Your CEO refuses to make decisions based on a spreadsheet graphic

Nobody in a senior position with an interactive dashboard visualisation in front of them has ever turned around and said, 'Could you just summarise this in a bar chart, and can you get a junior member of the team to pick the filters for me?' It is a 1990s way of representing data and should be used sparingly today.
Dashboards allow senior leaders to use their wisdom and explore their own company data. When your senior leadership team rejects potentially misleading charts and insists on real insights, you are winning the upskilling game.

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