

BECOMING DATA LITERATE

Building a great business,
culture and leadership through
data and analytics

DAVID REED

Foreword by Adrian Gregory,
Co-founder and CEO, DataIQ



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Foreword

I would be lying if I said I was passionate about data. My passion is business, specifically helping people in business who drive performance, especially when they use data to achieve success. I love what data can achieve when used intelligently.

Successful businesses create. They create opportunities, wealth, jobs and careers, relationships, solutions to problems and, most of all as a combined economic force, businesses create growth and progress.

To prosper today demands being data-driven. As Silicon Valley has shown with the success of Amazon, Apple, Facebook and Google, this is how prominent market positions and remarkable valuations are created.

But established firms are fighting back. In 2021, for the third consecutive year, 99% of firms in the Fortune 1000 are investing in data and artificial intelligence (AI) according to research by New Vantage Partners published in the *Harvard Business Review*.

However, while these data capabilities continue to accelerate, very few are delivering the anticipated results, the *Harvard Business Review* reported in February 2021. This is very much in line with our own research findings and experiences with the global, FTSE 100, large- and mid-market organisations that make up the DataIQ community.

Why is this? You will find many of the reasons called out in this book, but a major issue that needs to be addressed is legacy culture, especially a lack of focus on people and their soft skills, including

the ability to communicate key data insights to non-data experts in senior management. It is this important step that leads towards developing successful data-driven businesses. Real-world examples from Aviva, GSK, Jaguar Land Rover and Zurich show how established firms are able to overcome these obstacles and pursue their visions.

DataIQ has taken the success factors we have seen time and again from companies like these and developed them into a framework for building a truly data-driven business – we call it the DataIQ Way.

It starts with the fundamental importance of aligning the organisation's broader vision and strategy with its data vision and strategy, and proceeds with building leadership, skills and culture – focusing on people, not technology. To compete and prosper, businesses need to become truly data literate and speak the language of data throughout the business, hence the title of the book.

The DataIQ Way is heavily evidence-based, built on years of hands-on experience working with established global, FTSE 100, large- and mid-market enterprises, combined with extensive research, and in-depth interviews with over 600 industry leaders. Throughout, it is based on practical experience rather than textbook theories.

My own love for data started in the early 1980s. As a young, impressionable marketing consultant, I first got excited about what was then called direct marketing and the potential it offered to drive sales and business growth. I visited one of the leading marketing agencies at the time, Ogilvy Direct, and picked up in reception a bright red brochure which simply said on the front, “Never sell to a stranger”. I loved it!

The theme, of course, was all about collecting and analysing data on consumers and from this understanding, sending them relevant messages to win their confidence and convert them to customers. It became known as one-to-one marketing, then data or database

Foreword

marketing and, more recently, data-driven marketing – we work in an industry built on buzz words!

Excited by the opportunities in data and with a passion for business, I set up the first of my five data-centric businesses in October 1988 and stayed with it right through its rapid growth in the second decade of this century. As often as this saw positive data usage and business growth, it also involved misuse and rogue operators. It was to combat this that I started DQM Group, out of which DataIQ launched in 2011.

I have known David Reed, this book's author, since the late 1980s and saw in his journalism the same interest in data – and maintaining standards – as I felt. His communication skills have allowed us to attract, develop and engage with our ever-expanding community of data and analytics professionals. I would like to thank David for the considerable work involved in researching and writing this book on top of his day job, and even more for the ten years we have worked together at DataIQ helping our members and the broader DataIQ community.

And it is people – data leaders and data practitioners – that make the real difference. Their expertise in applying technology and techniques to raw data, combined with an ability to communicate findings effectively, that allows their organisations to harness the power of data, transform their businesses and create truly great data literate businesses.

A growing number of organisations are on this journey, many of them still at the early stages. We are confident that by focusing on the methods and framework detailed in this book, you'll be able to fast-track your own progress to data-driven success and even become a great business.

Adrian Gregory
Co-founder and CEO
DataIQ

Introduction: Towards evidence-based decision-making

*“The substance of things hoped for. The evidence of things
not seen.”*

– Hebrews 11.1

IN 1999, THE then Health Secretary in the UK government, Frank Dobson, wanted to understand the balance between cost and effectiveness of drugs prescribed by the National Health Service (NHS). Typically, decisions about prescribing were being made at a local, rather than national level, creating a culture of ‘postcode prescribing’ with differences in the treatments available across the country.

Wanting a change in approach to make delivery consistent everywhere, he appointed Sir Andrew Dillon to be the first chief executive of the National Institute for Clinical Excellence (now NICE – National Institute for Health and Care Excellence), who set about appraising widely prescribed drugs for their benefit to patients and costs to the NHS.

It was the birth of evidence-based decision-making in healthcare and a model for what the data industry is currently trying to achieve in the commercial realm. Instead of leaving each stakeholder to decide based on their own experience and intuition, end-to-end data on

options through to outcomes is assembled, analysed and modelled to reveal patterns and insights. These can then be used to support decision-making and, in the process, often transform the choices that are made.

As NICE discovered early on, data-driven decision-making can be controversial. Its first ever recommendation was that the NHS should stop prescribing Relenza, an antiviral treatment for flu, because it did little to reduce the impact of the illness on high-risk groups, such as the elderly and asthmatic. Mike Thompson, chief executive of the Association of the British Pharmaceutical Industry, commented on this decision: “That was the day that the world changed forever for the pharmaceutical industry and I think companies got it.”

Data leaders may feel that they stand on the brink of their own world-changing moment as they build out their data offices and seek to build levels of data literacy across the organisation. In view is a transformation of the strategies, decisions, processes and value that can be realised. But there are many obstacles to overcome, from political resistance and entrenched cultures through to data silos and technology debt. To a leadership that was appointed for its technical abilities and with the tailwind of advocacy for data – created by terms such as the ‘Fourth Industrial Revolution’, for example – these can seem insurmountable and outside of personal competence and skillset.

The DataIQ Way has been built as a framework to guide data leaders on this journey. As this book outlines, there are actions, issues and resolutions that can be linked together to form a pathway towards data literacy and a true data culture, including evidence-based decision-making by the senior executive downwards.

Our approach is itself evidence-based. Since launch in 2011, DataIQ has published over 1,500 articles and news stories which have told the story of data’s growth during the ‘golden decade’ of interest and investment. It is worth noting that until 2012, the term ‘big data’ was still the preserve of life sciences and cloud computing was

viewed with suspicion by IT departments – a far cry from the current situation in which the UK government has developed a National Data Strategy to reap the benefits of this resource.

We have carried more than 800 profiles of data leaders in the DataIQ 100, our list of the most influential people in data that debuted in 2014. That same year saw the launch of the DataIQ Awards, which have attracted in excess of 600 entries to date. Our research programme has solicited responses from nearly 3,500 data practitioners as part of 24 survey pulses. Since the launch in 2017 of our membership service, DataIQ Leaders, we have had over 30 group discussions lasting some 100 hours with the most senior figures in the data industry and have welcomed some 700 data practitioners to our workshops. Through the DataIQ Podcast, we have also carried out deep dives with more than 40 data leaders.

This author has been involved across all of these activities, gaining as a result a profound understanding of the role data is playing in every sector and scale of organisation. The synthesis of this knowledge is presented in this book, while practical support based on this framework is now available to our membership.

For the NHS – and the UK population as a whole – the pay-off from the shift to evidence-based decision-making was very clear when the Covid-19 pandemic broke. Close links had grown up between academia and the life sciences sector through this shared mindset and research-based approach to pharmaceutical development. As a result, an accelerated vaccine programme allowed the UK medicines regulator to be presented with early-stage evidence and recognise that the tests involved had been properly structured and that the vaccine production process could prove its safety. This led to the country being able to vaccinate the population at a faster rate than countries within the European Union. It has also led to the creation of the role of national director of data and analytics in NHS England – a clear indicator that the culture of seeking evidence is now formalised in healthcare.

We believe that publication of this book ushers in the day when commercial organisations experience a similar fundamental change as senior executives finally recognise the central role data can play and the transformation in their culture it will bring about.

CHAPTER I

Laying data foundations

Roadmap – in this chapter:

- Data integration can appear too expensive for individual projects to afford.
- If multiple projects need to draw on the data asset, they can be ‘taxed’ to pay for it.
- Without integrated data, value-creating projects will stall.
- Data quality is another obstacle that can cost 8.8% of annual revenue.
- Data technology is becoming a commodity – more affordable, but providing less competitive advantage.

Technology is not the transformer

Crossing the data bridge

BACK IN 2018, the chief data officer (CDO) of a telco giant recognised the opportunity that existed from monetising anonymised, aggregated location data. As a tool for developing and supporting services as well as for the targeting of marketing messages based on retail proximity, mobile data has unsurpassed coverage and depth.

But there was a problem. Data silos existed right across the business, which had grown through acquisition as much as organically. Data management had tended to be an afterthought and was under-invested. While the business case for putting location data into the marketplace was compelling, it would require significant upfront investment into data integration with year one costs in excess of expected revenues. This made getting buy-in from the executive a real challenge.

As many data leaders have discovered for themselves, despite the impetus behind data as a transformational asset and the widespread advocacy for adopting data and analytics, it can be a struggle to get their investment case approved. This is because of the point of view that, 'the first person to cross the river pays for the bridge'. What this means is that the full cost of a data project, such as a major data integration, is often imposed on the first new business project which needs it, be that a digital transformation or a new data product.

So how can the CDO get around this obstacle? The approach taken at that telco was to build up a fund by including an incremental levy or data tax on all business projects in the run-up to and during digital transformations. Just like the tolls paid by traffic to cross a real bridge and thereby pay for the cost of its construction, gaining

smaller contributions towards a larger project means that no single business process or department leader is left facing the whole bill. This can also establish the data office as a stand-alone function with cross-functional support from within the business, giving it greater independence and resilience.

Accelerating growth of digital technology and its adoption by organisations, governments and consumers will be the indisputable trend of the 2020s. As part of this, data is moving from being a simple raw material that fuels these technologies to being a form of digital currency – the price of operating in the digital space at any level is the supply of data in some form.

For companies that want to thrive – and more pressingly for those which hope to survive – during the 2020s, rapid adoption and maturity of data and analytics capabilities is therefore fundamental. This was already recognised in the 2010s when data-led transformation was just getting underway under the badge of ‘big data’.

In a landmark report by Nesta, the UK’s innovation foundation, published in 2014 under the title, *Inside the Datavores*, the authors noted: “We find that a one-standard deviation greater use of online data is associated with an 8% higher level of productivity – firms in the top quartile of online data use are, other things being equal, 13% more productive than those in the bottom quartile. When we distinguish between the different data-related activities that firms undertake, we find that greater data analysis and reporting of data insights have the strongest link with productivity, whereas *amassing data has little or no effect on its own.*”

Firms have taken notice of this and investment into data foundations is now a differentiator between leaders and laggards across most sectors. As the UK’s National Data Strategy spelled out in 2020: “Poor data foundations can be a real blocker for driving the transformative power of data. For example, when the source data needed to power AI or machine learning is not fit for purpose, it

leads to poor or inaccurate results, and to delays in realising the benefits of innovation.”

Growth can be driven by taking the first steps into data and analytics, especially if transforming from a very low, immature base. The economic argument for doing so is virtually irresistible and can often be made by focusing on fixing the data foundations ahead of innovating and value creation.

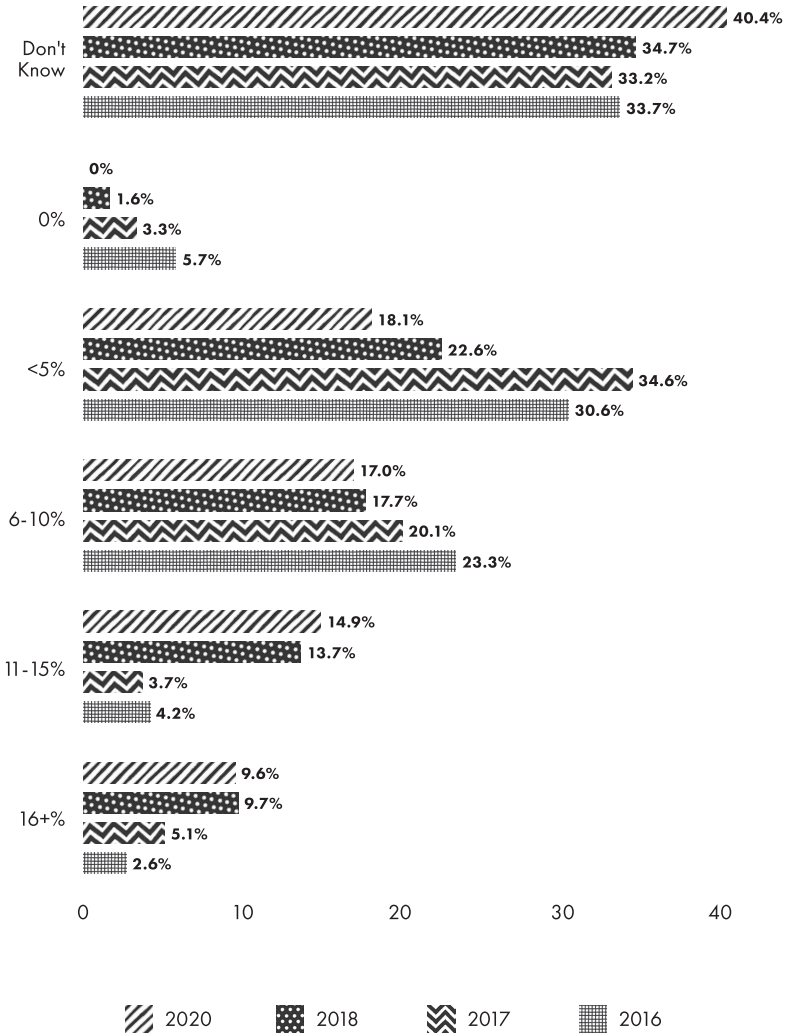
As an example of this, the digital transformation of the Lloyd’s of London insurance market is expected to remove £800 million in operating costs, equal to 3% of its current total operating costs, with a core data store being built to support digital processing. Its roadmap, Blueprint Two, spells this out clearly: “The transformation envisaged is only possible if complete, accurate and timely data is available to support and connect digital processes. It is the quality of this data that makes the difference between an automated process that happens immediately and a manual process that routinely takes days today.”

Similarly, Lorenzo Bavasso, data, analytics and AI director at BT Global, states: “We have to move towards data foundations that are defined/built for every business function to define their data-driven plans and execute them. Also, the funding approach has to evolve from central/use case-based business cases to a model where the core capability is built as a fundamental need of the business and then exploited (value-driven) across the business, with a degree of autonomy.”

Another common basis for the investment case into data foundations is to fix issues with poor data quality. Unless concerted attempts are made to resolve these, they can have an ongoing and direct impact on turnover by increasing costs (through customer service overheads or logistics failures) or decreasing revenue (through lost customers, sales and opportunities).

As Figure 1.1 shows, this negative impact continues to rise, hitting an average of 8.8% of annual revenue in 2020 compared to an average of 5.6% in 2017. This not only flags that data quality can be an evergreen thorn in the side of the organisation, but it also presents a risk – fines for violations of the General Data Protection Regulation (GDPR) in the EU (or Data Protection Act (DPA) in the UK) can reach 4% of global turnover. A clear link can be made between errors and gaps in data and the ability of an organisation to know whether its data has been breached.

Figure 1.1: Average annual cost of poor-quality data



Pens, pencils and winning the (space) race

Given the need to put data foundations in place, it can be tempting to view data technology as both the fix for existing problems and also the heart of a digital transformation. But technology rarely achieves the second of these goals in its own right, as a story from the early days of the space race helps to illustrate.

NASA discovered it faced a technical challenge – astronauts needed to be able to write and carry out calculations, but conventional pens would not work in an environment where the temperature could swing between minus 50 degrees Fahrenheit and plus 400 degrees. So it invested millions of dollars into R&D to come up with specially engineered space pens. Meanwhile, the Russian space programme simply gave its cosmonauts pencils.

It's a story to gladden the heart of any financial director, speaking as it does to thrift and the avoidance of over-engineered solutions. Widely told, this example is often given as a cautionary tale about seeing technology as the solution without considering alternatives or existing assets.

Unfortunately, it's not true. NASA did overspend on writing tools, buying 34 mechanical pencils from Houston's Tycam Engineering Manufacturing in 1965 for a total of \$4,382.50 or \$128.89 per pencil. But Russian space travellers did not use regular pencils because they are flammable, could snap during use and create dangerous litter inside a capsule.

The reality of how writing in space was tackled is actually more interesting and even more relevant when thinking about investing in data foundations. The private company Fisher Pens invested a reported \$1 million to develop a patented space pen that worked in the extreme conditions faced by astronauts and cosmonauts. And it sold these pens to both the Apollo and Soyuz programmes at a cost of just \$2.98 each.

Across the data and analytics space, private companies are investing heavily to develop the tools and solutions needed by organisations and provide them as cloud-based or as-a-service products. Just as with space pens, these solutions are available to all-comers at commodity prices.

This makes the creation of strong data foundations more achievable, just as Fisher Pens allowed space travellers to write easily and cheaply. But at the same time, putting these data foundations in place does not confer any competitive advantage in itself since the same technology can be adopted by rivals, start-ups and disruptors.

It is a common misperception that technology in itself provides the fix required. In fact, this is very rarely the case. As we explore in subsequent chapters, it is the shift in culture and the unlocking of a new vision for the business, combined with an alignment between business strategy and data strategy, that ultimately transforms any organisation. Data literacy means understanding how to create a great business with data at its heart, rather than trying to become a data business.

DATA LITERACY STEPCOUNTER

At the end of each chapter in this book, you will find some key steps that we have identified as critical points on the DataIQ Way journey. In the final chapter, we bring these together in the wireframe for your own progression.

Steps 1–3:

1. Fund data foundations progressively to remove financial objections.
2. Use data quality as a cost justification.
3. Recognise that data technology alone does not bring about transformation.

CHAPTER 2

Organising for data and analytics

Roadmap – in this chapter:

- Zurich Insurance UK and Samsung Europe started with specific, constrained goals for data that rapidly grew.
- GSK Consumer Healthcare and Lloyd's of London are putting data at the heart of business transformations.
- Some 83% of organisations are pursuing digital-first transformations.
- Data needs to be organised into its own department – a central data office.
- Reporting lines for the CDO vary widely, but also have a significant impact on the CDO's effectiveness.
- Roles can be defined by the tasks involved – centralisation avoids duplication of effort and conflicts of view.
- Standardisation of roles is lacking in the data industry, leading to over-demand and salary inflation.

Vision

Recognising the vision gap

IN 2018, ZURICH Insurance UK recognised it had a data problem. A complex and fragmented data estate had grown up covering over 20 separate legacy systems. Management information (MI) had become sprawling and uncoordinated with over 400 processes being supported and extensive legacy reports being produced. As Anita Fernqvist, CDO and director of operations at Zurich Insurance UK, recalls: “Data had become a major issue for the organisation that needed focus, dedication and investment and, due to my delivery track record, I was asked to take up the challenge. In year one, I carried out a data deep dive, proposed a strategy and created a data architecture and analytics function, securing significant investment for delivery. By year two, we had put live the first phase of our strategic data asset and laid firm foundations for becoming a truly data-centric organisation, with year three significantly maturing the asset and the benefits flowing into the organisation.”

Driven by the problems this lack of data integration was causing for its property and casualty market managers, Zurich Insurance UK recruited Fernqvist as its first CDO within its then data architecture and analytics (DAA) team, supported by a team of ten. Working across data architecture, data quality, DevOps and portfolio management, the team rapidly grew to 30 (and subsequently several hundred). Their goal was to revolutionise the way data was stored and used through the creation of a strategic data asset as an enabler of a mindset shift – from viewing data as a risk to giving it a voice in the boardroom and becoming a key decision-making support.

A data strategy, roadmap and operating model gained sign-off from the new management team. To ensure engagement across the enterprise, roadshows were used to showcase what the data team was capable of delivering, combined with presentations to leadership

groups, attendance at team meetings and webinars. As a consequence, the data office itself has created a new, engaged culture across the business which has embraced its potential – even the CEO has used the hashtag #dataisthenewoil in social media posts.

Fernqvist recalls: “I was asked to run what was the MI team at Zurich, and work with the team to determine a suitable data strategy for an organisation with a burning legacy landscape, high expectations and, in turn, frustrations.

“It did not start out big, or glamorous, but a strategy turned into a delivery roadmap, which in turn led to creating a data function, building a data asset, and developing a data culture across the organisation. We have since added predictive analytics and robotics, and now have a large function delivering on the second phase of the data and analytics strategy.

“We started small, battled to get our voices heard, and step-by-step built a mature data capability. There have been many successes, and just as many lessons learned the hard way. It has been quite a journey.”

Identifying a gap between the vision which the organisation has for its operating model and the ability to deliver against it is a common experience. So, too, is launching the solution from within a constrained function which rapidly demonstrates value and evolves into a formal data office.

Samsung Europe is another example of a business that also in 2018 recognised the gap between its existing operations and the vision it had set for itself to “inspire the world, create the future” via richer digital experiences delivered through innovative technology and products. Internal processes and decision-making, however, were still rooted in legacy technologies. Although data-rich, much of this data existed in silos, meaning it took an average of 18 days for business intelligence (BI) teams to develop a data-driven insight. It also lacked any pan-European view of business performance across its 17 subsidiaries in over 34 countries.

To tackle this, the European consumer and market insights team adopted a new harmonised data model that allowed it to aggregate multiple data sets and present a consistent view to the business. This supports a weekly, country-level scorecard which is used by the European president of Samsung downwards to optimise media planning and spending, track sales and market share, and see how marketing is impacting on commercial Key Performance Indicators (KPIs).

But the real goal of this project was not to end up with a new BI tool, but rather to increase the level of data maturity and data literacy across the business, leading to evidence-based decision-making and a stronger focus on customer-centric activities. A user community of over 300 has been progressively increasing its ability to read, work with, analyse and argue with data in order to make recommendations for business activities across European markets.

Adopting a commercial vision for data

Setting a vision for the organisation has important consequences in terms of the business strategies that will be adopted, where value is expected to be created, the culture it operates and the enabling resources that are required. Success follows from approaching the task in this sequence, rather than looking at the existing resources that are in place and trying to wrap a new vision around them.

This concept of a sequential journey towards a high-performing business that has data in its DNA – a data literate organisation – is at the heart of the DataIQ Way. By focusing on the core dimensions and supporting pillars involved, rather than pursuing a single fix such as new data foundations, maturity can be progressively improved. This path is explained in detail in Chapter 3.

An example can be found at GSK Consumer Healthcare, the joint venture between GSK and Pfizer, which has the vision of becoming a stand-alone, world-leading provider of over-the-counter

consumer healthcare products by 2022. To deliver against that goal, it has the stated strategy, “to focus on excellence in innovation to develop world-class brands, and on building our reputation through best-in-class interactions with retailers, healthcare professionals and shoppers”.

To underpin all of this, a data office has been created from scratch which, during the course of 2020, grew from a headcount of four to a target of 50, overseen by GSK Consumer Healthcare’s first global CDO, Wade Munsie. He has identified data literacy as a vital component, creating a common language and understanding around data across 94 global markets.

Crucially, the data office under his leadership is translating four elements of the company’s vision into specific data activities. Munsie sets out the data vision as, “accelerating our human understanding, enabling bold decisions to fuel growth”. This aligns the data strategy to the corporate vision across four pillars:

- *Trust* – building trust in data across the enterprise by getting the foundations right.
- *Empower* – unlocking the value of data to support and empower the business.
- *Beat the market* – using AI and data science to take analytics to the next level.
- *Mindset* – building a data-driven mindset across the enterprise.

Lloyd’s of London, in another example of an organisation that has adopted a new vision, is pursuing a digital transformation and harnessing data to support these goals. Future at Lloyd’s laid out the vision in a May 2019 prospectus, stating: “We are going to combine data, technology and new ways of working with our existing strengths to transform the culture we work in and everything we do – from placing risks and paying claims to attracting capital and developing new products.”

Blueprint One was the ambitious plan for how it would progressively move towards this new target operating model. It included the goal that the business will be underpinned by “a data-first approach, evolving over time from a document world to a document-plus-data world to a data-first world”. What Lloyd’s has recognised is the potential for data to support this new vision if the right enabling resources are put in place. As the blueprint spelled out: “Data is not exciting by itself until it is defined, standardised and made available to the appropriate people; then, data is truly transformational to everything built on top of it.” By the time an updated Blueprint Two was published in 2020, Lloyd’s had recognised that data was the critical foundation on which its new digital operating model would be built.

Why data-driven is not a vision

Talk of data-fuelled industrial revolutions and market disruptions has created awareness of the potential of this resource right across the business world. In parallel with this recognition that a new vision might be possible there runs a level of anxiety. For one thing, it can seem to be too late to get in the game for companies that have not kicked off a digital transformation already or formalised their data strategy and assets. It can also seem like a domain reserved for global combines with turnovers running to billions of pounds, like GSK and Lloyd’s of London, rather than an opportunity for companies at any scale.

One response to this can be a rush to adopt some form of data-driven activity in order to feel part of the trend. Typically, this might involve adopting data visualisation tools as part of a move away from Excel-based reporting, for example. BI is often a bridgehead for more complex data engineering and data integration.

What should not be assumed is that adopting new data tools is a vision in itself. Transformation does not happen because of tools

and technology – it happens because the business has a vision of operating in a different way and achieving a different level of performance.

It is important to realise that, for all the advocacy around digital transformation and data as an asset, these are still early years. The technology aspects of this supposed revolution are easier to implement. According to research carried out by DataIQ in spring 2020, 41% of organisations claimed to be transforming the whole company to be digital-first. A further 42% had embarked on digital transformation within some of their departments. By contrast, the same study discovered that only 16% of organisations described their adoption and usage of data and analytics as advanced, with the majority (53%) saying they were still developing this capability.

Data-driven is not a vision in itself. But a vision that does not harness the transformational power of data is unlikely to succeed. A vision which embraces data as a core enabler moves closer to becoming reality by a critical step.

DataIQ Way Marker

Vision without data lacks perspective, data without vision
lacks ambition

Structure

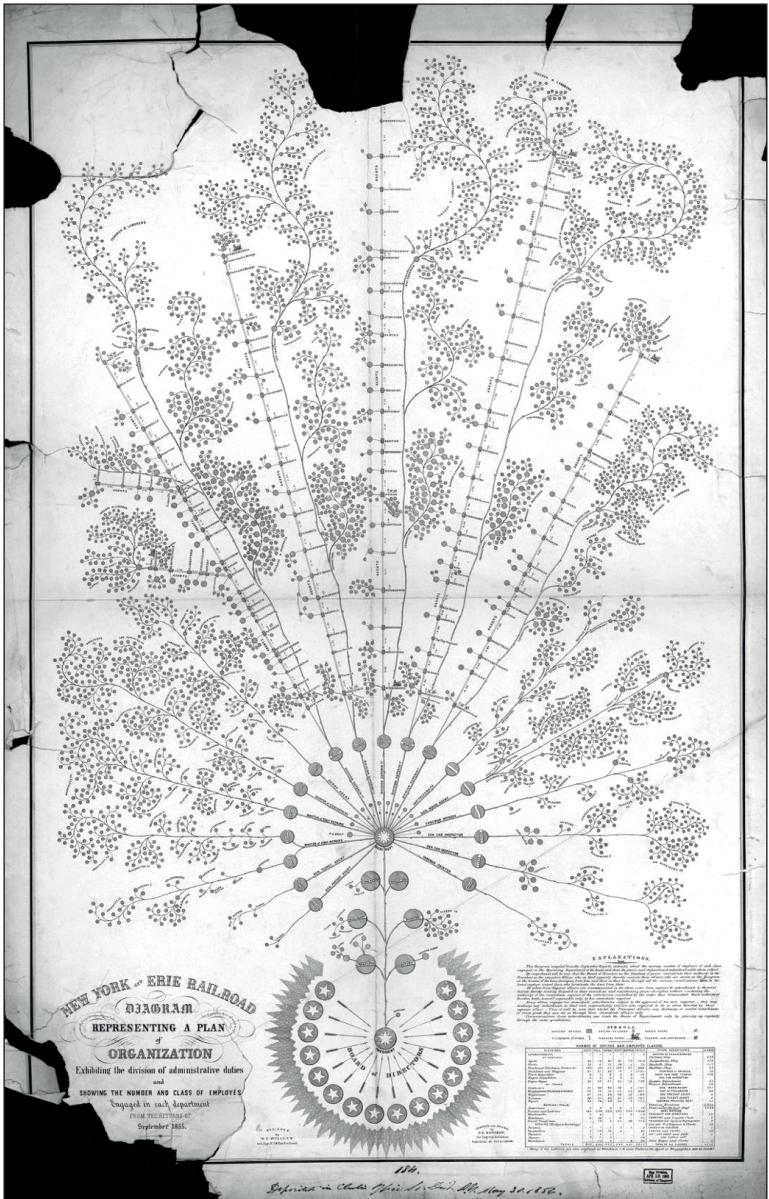
Data as a department

To achieve the vision of the organisation and execute on its business strategies, an organisational structure needs to be in place. This allows for tasks to be allocated, coordinated, supervised, measured and reported on. Many different organisational structures have been adopted to manage this, but in most cases specific functions exist

to support common processes, such as sales, marketing, HR and IT. Specialised functions are efficient because they are able to deliver standardised, replicable approaches to recurring tasks.

Organisations have wrestled with the best way to assemble teams for nearly two centuries. Probably the first ever organisational chart was created in 1855. Called ‘The New York & Erie Railroad diagram representing a plan of organisation exhibiting the division of administrative duties and showing the number and class of employés [sic] engaged in each department from the returns of September 1855’, it is rightly hailed as a great early example of data visualisation, despite its complexity (see Figure 2.1 or visit <https://tinyurl.com/y5fv6y2c>). As can be seen clearly, this is a very linear organisation based around geography and product lines, with few of the overarching functions that a modern organisation would expect to see.

Figure 2.1: New York and Erie Railroad



This operational and manufacturing-led view of organisations and their functions continued until the 1930s when recognising the role of overarching functions, such as sales and marketing, led to their establishment. These then continued relatively unchanged until the 1980s, which saw a number of significant transformations, such as that of accounting into finance as company flotations and market listings demanded more focus on asset and revenue management, while the recognition of people as a critical business asset from the 1990s onwards saw personnel departments rebranded as human resources. Nowadays, these functions are common in all organisations and well understood to be essential.

Data as a department is a much more recent phenomenon, requiring the emergence of data from within the IT function as a specific area of focus in the twenty-first century. Two trends have driven this:

- The first is the accelerating adoption of digital technology, initiated by the commercialisation of the internet in the late 1990s.
- The second is growing regulation of data as a specific area of concern, not just within data protection legislation – such as the EU’s GDPR, California’s Consumer Privacy Act or the UK’s DPA – but also within industry-specific legislation, especially financial services and regulations such as Know Your Customer and Anti-Money Laundering, which have profound data implications.

Recognising this, organisations have progressively been turning to the data office as a specific department to own the issue of data governance (including data protection, privacy and data quality) and increasingly value creation through data analytics. This has been a relatively slow-growing trend, however. Capital One appointed probably the first CDO in 2002, while Yahoo! made a more high-profile appointment in 2005, but overall numbers remained low until about 2008–2010 when the post-financial crisis response of banks included introducing the CDO role and the creation of data as a department. Many had been scared into this by the recognition that they did not know as a reconciled number how many net

customers they had, what balances or debts they held and therefore what their total exposure was likely to be.

While logical, creating a data office and recognising that data needs a stand-alone department is complicated. This is because of the horizontal nature of data as an activity across any organisation – it is fed by and supports virtually every other function in some way, rather than being a vertical function in its own right. In many respects, it can look exactly like the New York & Erie Railroad chart in Figure 2.1 with nodes and spurs feeding from every part of the business. For this reason, data is often incubated (and constrained) within an existing function, such as marketing or finance, while it begins the task of establishing standards, common data models and integration of data sets, and then feeds back reports, insights and data products to the business.

Research carried out by DataIQ in 2020 revealed that these internal business processes and operations were as likely to be the focus of the data office as more external customer-facing activities. When asked about their business purpose for collecting personal data, out of the top four reasons given, two were customer-oriented – optimising the customer journey (80.6%) and tailoring content to each individual (61.2%) – while two were entirely business process-oriented – fuelling analytics (73.5%) and measuring business performance (69.4%).

This demonstrates both the breadth of tasks in which the data office may find itself involved and also the key role data now plays in driving the business and its decision-making.

DataIQ Way Marker

Recognise data formally in your organisation
and build from there



Aligning data with the business

With the recognition that data requires specific status as a department comes the need to decide where it will sit within the organisation. As has already been noted, the horizontal nature of data's role makes it a difficult piece to fit into any organisational chart. But as EY wrote in a 2018 report, *Becoming an analytics-driven organisation to create value*, putting data into the organisational chart – rather than allowing it to exist either in multiple places or to operate without formal recognition – affects the level of impact it can have.

“Without the right organisational structures, processes and governance frameworks in place, it is impossible to collect and analyse data from across the enterprise and deliver insight where it is most needed. This results in a siloed approach to big data deployment that limits a company's ability to find, measure, create and protect value across diverse operational areas,” wrote the authors.

It is a reflection of the recency of the concept of data as a department and its low level of maturity that there are no consistent models for what the correct organisational structure should look like. As a result, different businesses address the issue in a wide variety of ways and the last five years have been typified by regular restructuring of CDO reporting lines:

- easyJet replaced its chief customer officer with a CDO in April 2018 reporting to the CEO, then in May 2019 created the new, combined role of chief data and information officer leading a new data function to support its vision of becoming the world's leading data-driven airline.
- Sainsbury's hired a new group chief information officer (CIO) in 2018 to handle the grocery chain, Sainsbury's bank, Argos and then newly acquired Nectar division. The incoming CIO laid claim to the data and analytics office which had been created the previous year.

- Royal Mail established its data office as an independent function, then in early 2017 moved it to sit under one of three CIOs who report to the chief customer officer. But it also created a stand-alone function of advanced analytics, leaving the governance responsibilities with the CDO.
- GSK Consumer Healthcare established its data office in late 2019, initially reporting to the chief digital officer, but that role was subsequently eliminated and a new reporting line to the CIO put in place.

DataIQ research and discussions by this author with data leaders reveal that most are less concerned about where they sit in the organisation and what their line of reporting will be than with their level of top-down support and ability to influence business stakeholders. One thing is clear, however. Placing data within the IT function (for example, as a direct report to the CIO) is a mistake as it typically constrains both the breadth of data's domain and also its sphere of influence. Data is most effective when it is either an independent department with a reporting line into the board, or has a value-creating department as its host.

DataIQ Way Marker

The voice of data needs to be heard in the
boardroom – not just in the back room



Upsides and downsides of structures

The purpose of creating any type of department is to allow tasks to be allocated, coordinated, supervised, measured and reported on. Given the range of sources from which data is derived and the breadth of processes it then supports, the argument for creating a data office in some form is difficult to withstand.

Formalising data into a department also addresses some of the critical aspects of data as an asset:

- *Standards* – establishing common standards (such as data definitions, data models, data quality, data governance) and shared ways of working.
- *Collaborative development* – developing data projects and analytics briefs in close cooperation across functional teams, especially where offshore or external business partners are involved.
- *Knowledge sharing* – creating visibility across all practitioners of the work stack as well as the tools and techniques available.
- *Connections* – ensuring data and analytics practitioners feel part of a community of practice.

Data and analytics undoubtedly benefit from the ‘network effect’ where the value of the service increases with the number of people using/delivering it. For a majority of organisations, the solution to the challenges above is to create a centralised data or analytics centre of excellence (ACE or DACE) where all practitioners are co-located, or combined into a small number of grouped operations.

Yet this is not necessarily appropriate or achievable for all organisations for a number of reasons. A prime argument against centralisation is where it is more effective to adopt a federated approach in which analysts are embedded alongside their business stakeholders, either individually or as teams (and even whole functions in some cases).

Having analysts embedded in the business is critical to how effective their outputs are and how well-aligned they are to business needs. At one mobile network operator, 60% of analysts were embedded, taking part in line of business meetings as well as having their own team meetings. Their presence alongside stakeholders helps because it means they adopt the same ways of working.

The downside of a non-centralised data function, whether federated or hub-and-spoke, is that it usually requires more management effort (and a degree of political skill) to maintain effectiveness

and motivation. Meeting schedules can become congested where practitioners are also engaging with their stakeholder function, for example, while specific resources, such as digital platforms, may be blocked by the governance rules in regulated industries.

Perhaps as a result of this, as Table 2.1 shows, data capabilities are 50% more likely to operate from a centralised department as they are to be federated into lines of business. The implications for where tasks get carried out are considered in more detail below.

Table 2.1: Data offices within the organisation

	(%)
Centralised or centre of excellence	43.2
Distributed or federated	27.0
Hub-and-spoke	13.5
Consulting	13.5
Other	2.7

Roles

Translating tasks into roles

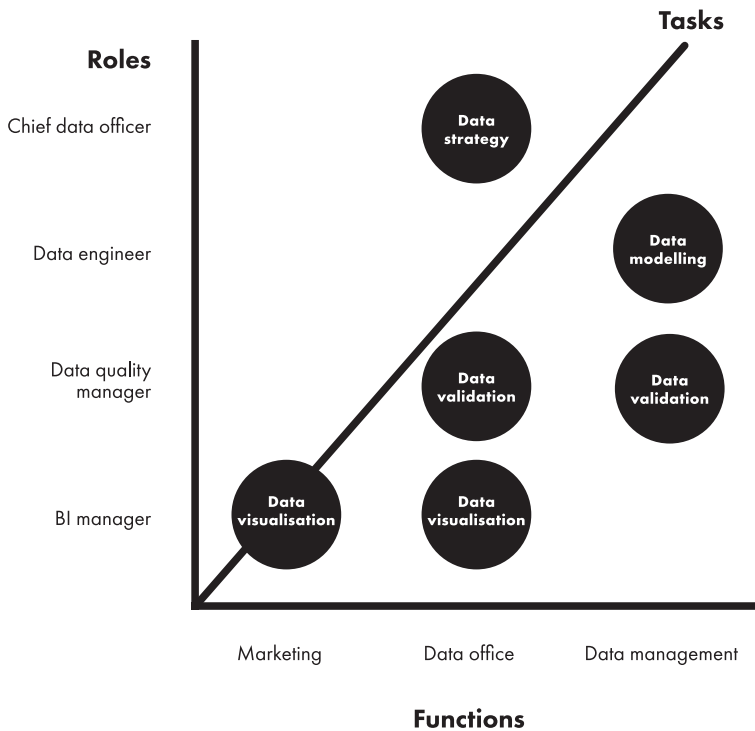
Data and analytics tasks can be assigned to roles in a wide variety of ways, including by historical role definitions, specific skills, resource availability, urgency and so forth. The location of these roles may be influenced by the desired operating model as outlined earlier (centralised, federated, etc.), but equally may reflect the level of data dependency of stakeholders.

An incubating function, such as marketing or finance, may absorb a wide range of roles, often in parallel with each other. Having multiple roles undertaking similar tasks is not necessarily inefficient – it can be a requirement of different roles to undertake overlapping tasks (i.e. reporting, data visualisation, data preparation).

Typically, tasks will cluster within roles and roles will also cluster within functions according to the depth of data and analytics dependency they have (see Figure 2.2). Centralisation of tasks into a data and analytics centre of excellence, for example, may be more efficient as it allows for an activity to be undertaken once and shared multiple times.

Federated data organisations can achieve a similar efficiency while remaining close to their internal customers, provided there is good visibility and communication between these practitioners and a recognition of their role in serving multiple internal customers, not just the function in which they are based.

Figure 2.2: Clustering of tasks within roles and functions



To federate or to centralise?

In a traditional organisational structure, roles are created according to the needs/demands of each function, rather than as a reflection of the task resourcing required. For example, each business function might create its own BI manager role in order to remove that task from other roles.

The closer to the point of use that a task sits, the more likely it is to have a role created for it (e.g. marketing will often have its own database manager), while tasks that sit further away from a business process often do not have a specific role created for them (e.g. data governance).

As a consequence, task duplication is almost inevitable within a conventional organisation (see Table 2.2), while task neglect is typical because of a lack of function ownership.

Table 2.2: Data tasks within conventional organisations

Task	Role	Function
Data validation	Data quality manager	Data management, Marketing
Privacy policy definition	In-house counsel, data protection officer	Legal, compliance, DPO office
Data mastering	MDM manager	Data management, Line of business
Metadata management	None	None

Role duplication is an extension of task duplication within conventional organisational structures. This is because functions create roles to deliver the data tasks they require close to the point of use (see Table 2.3). The issue with function-level role creation is that best practice does not get shared, knowledge transfer is limited and gaps in provisioning go unnoticed. It can also lead to competing views on key numbers, such as net customer base or demand forecasts.

Table 2.3: Data roles within conventional organisational structures

Function	Role	Task
Analytics	Customer churn analyst	Churn propensity modelling
Customer management	Retention manager	Churn propensity modelling
Marketing	Customer marketing manager	Churn propensity modelling
Board	Chief customer officer	Creating single view of the customer
Data management	Customer database manager	Creating single view of the customer
Business intelligence	Customer analyst	Net customer figure report
Finance	Chief financial officer	Net customer figure report
Compliance	KYC manager	Identity validation
Ecommerce	Channel manager	Identity validation
Information security	Information security officer	Identity validation
Customer experience	Cx manager	Behavioural modelling
Data science	Data scientist	Behavioural modelling

Centralisations of roles, for example into a data and analytics centre of excellence, removes role and task duplication while supporting multiple internal customers (see Table 2.4). A similar multi-stakeholder effect can be achieved by using a virtual data and analytics organisation where roles are based within a specific business function, but serve multiple stakeholders across functions.

Management of this virtual data and analytics organisation can be more challenging due to the pressures and immediacy of the host function's deadlines compared to stakeholders elsewhere in the organisation. Service level agreements are important, as is political cover and protection for these roles when conflicts arise between competing deadlines.

Table 2.4: Data roles within a centre of excellence: task-based view of customer data roles

Task	Role	Function	Customers
Creating single view of the customer	Customer database manager	Data and analytics centre of excellence	Marketing
Net customer figure report	Customer analyst	Data and analytics centre of excellence	Board, Marketing
Churn propensity modelling	Customer churn analyst	Data and analytics centre of excellence	Marketing
Behavioural modelling	Data scientist	Data and analytics centre of excellence	Cx management
Identity validation	Information security officer	Information security	Ecommerce

The reality of multi-stakeholder data and analytics tasks

Data and analytics tasks are rarely unique to a single function since the way in which data or models are defined, distributed and operationalised inevitably involves multiple roles. Unless these have been centralised, these roles will sit within multiple functions, so any data-driven process involves a level of project management.

This project management, without the leadership of a centralised data and analytics department or a virtual organisation, can be one of the most challenging aspects of achieving these tasks. This is particularly true of tasks which are not owned by any one function (e.g. data governance).

Tasks can be categorised in such a way that the process required to ensure they are achieved becomes visible. Example categories are:

- communication
- definition
- distribution
- monitoring
- reporting
- operationalisation
- ongoing management
- remediation
- training.

Not every task will involve every category, while some will involve all (and potentially additional) categories. An example of how tasks can be categorised and their multi-stakeholder nature identified is given in Table 2.5 for data quality.

Table 2.5: Categorising tasks and assigning to functions (conventional organisation)

Definition	Distribution	Monitoring/ Control	Reporting	Operationalisation	Ongoing management	Remediation	Communication	Training
Task: Data collection policy	Task: Data collection processes	Task: Data collection	Task: Data KPIs	Task: Data collection	Task: Data storage	Task: Data correction	Task: Policy changes	Task: Policy adherence
Function: Data strategy	Function: Data management	Function: Commerce, Marketing	Function: Data management	Function: IT	Function: IT, Data management	Function: Data quality, Data management	Function: Data management, Marketing	Function: Data management
Task: Data standard		Task: Metadata control		Task: Data steward	Task: Database software maintenance	Task: Metadata correction	Task: Data steward recruitment	
Function: Data management		Function: Data quality, Data management	Function: Commerce, Marketing, Sales, CRM		Function: IT, Data management	Function: Data quality, Data management	Function: Data strategy	

Establishment and headcount

While assigning tasks to roles is a relatively straightforward issue, deciding how many of each role is required within the organisation is less simple to define. This is often because there is low visibility of the volume of demand for each task to support a definition of establishment levels across the headcount. Understanding the value of these tasks is even more challenging. For example, if multiple functions need to create specific reports on KPIs, this could lead to an excessive headcount of BI roles unless a review is carried out of those reports, leading to optimisation and even retiring of many unused metrics.

When creating a data office from scratch, one of the first tasks is often to undertake exactly this type of review, taking ownership of KPI reporting and reducing the workload to a manageable level. If this is not done, the data office will not be able to move from being reactive – delivering against stakeholder demands as and when they arise – to being proactive – leading stakeholders with insights derived from standardised data.

One of the main arguments for adopting a task-based view of roles is cost-effectiveness. The market for data practitioners is overheated at almost all levels, leading to salary inflation, which is exaggerated within certain in-demand roles, such as data science or data engineering. If these are broken down into task sets, it may be possible to define a role that does not have the inflationary role name but still delivers the right skills and abilities.

DatalQ Way Marker

Getting tasks done is more important than what
you call the person doing them



DATA LITERACY STEPCOUNTER

Data literacy has to be an enterprise-wide endeavour which sees data as indispensable to achieving corporate goals.

The data department has to establish and manage itself effectively to support this.

Steps 4–6:

4. Translate the corporate vision into a data vision and keep them closely aligned.
5. Establish a data office, ideally as an independent department with direct reporting to the board.
6. Define roles within the data department by the tasks required to avoid duplication of effort.