How To Build And Engage Data Teams To Deliver Transformational Change

cynozure

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Introduction

Delivering value from your data strategy relies on having a team of strong people to do the work. There is much promise held within data, and the goal of any leader is to devise a plan that unlocks it. The ones leading the way are organisations who have created an effective data team, from their data leadership to solution delivery, data governance and supporting players.

This hinges on several factors that include a strong data culture, data literacy across the organisation and diversity within the data team. It necessitates a multifaceted approach that involves external recruitment, internal learning and development, clear career progression, diversity and inclusion initiatives and, eventually, using data to manage teams.

Getting your data team right is pivotal for business leaders. Companies that deploy effective data teams into their operation show productivity rates and profitability that are 5% to 6% higher than those of their peers [1].

To achieve this, we recommend a strong game plan: a solid framework to build, manage and extract maximum value from your data team. This whitepaper is a definitive guide to building a data team that delivers such results.

Introducing key roles in your data team

Many different people are key to the success of a data strategy. A strong team ensures strong results - from the data leader at the very top, to the data scientists and analysts delivering solutions and data governance ensuring due diligence. Here are some of the key roles to hire within your data team.

Chief Data Officer (CDO) – The Game Changer In Your Organisation

Organisations that are really tackling this issue head-on appoint a Chief Data Officer. This individual is the business' ultimate advocate for data and the one that focuses on ensuring maximum business value is gained from it. Opening conversations organisation-wide about how data can supercharge the business and improve employees' daily work. Yet, they must also be someone who can take a holistic view across the organisation. To join-up initiatives, call out risks without an emotional connection and report back impartially to the board.
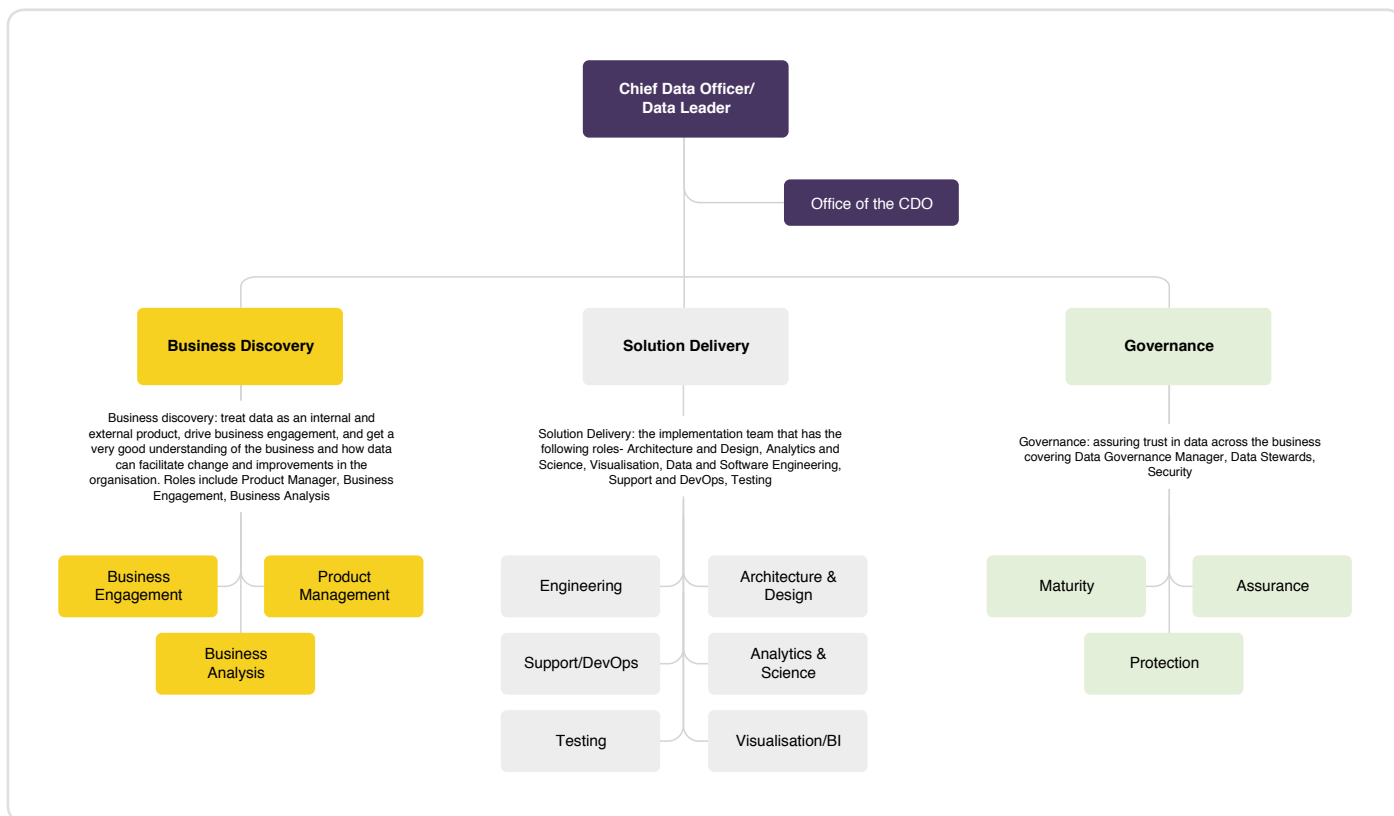
They can identify opportunities to leverage programmes as delivery moves from the classic waterfall set-up to a more iterative and agile-led business, connecting the digital enterprise together. The CDO works across the business as an agent for change, raises the bar operationally, works alongside new product teams and (when sat with the board) offers genuine guidance and thought leadership.

A CDO is a champion for data

Data holds value in enabling organisations to make better, more timely and to-market decisions. However, one individual alone cannot unlock its potential. Therefore, someone in the role of CDO has to focus on being the catalyst and inspiration for change and momentum in the organisation. the work is then delegated across the data team and to others (a task which is made much easier when the entire organisation has a certain level of data literacy).

A CDO will build an effective ecosystem around themselves

A large part of the democratisation of data will involves the appointment of data champions. These

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                    ┌─────────────────────┐
                    │ Chief Data Officer/ │
                    │    Data Leader      │
                    └─────────────────────┘
                              │
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                    │   Office of the CDO  │
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Business Discovery	Solution Delivery	Governance
Business discovery: treat data as an internal and external product, drive business engagement, and get a very good understanding of the business and how data can facilitate change and improvements in the organisation. Roles include Product Manager, Business Engagement, Business Analysis	Solution Delivery: the implementation team that has the following roles- Architecture and Design, Analytics and Science, Visualisation, Data and Software Engineering, Support and DevOps, Testing	Governance: assuring trust in data across the business covering Data Governance Manager, Data Stewards, Security

Business Discovery:
- Business Engagement
- Product Management
- Business Analysis

Solution Delivery:
- Engineering
- Architecture & Design
- Support/DevOps
- Analytics & Science
- Testing
- Visualisation/BI

Governance:
- Maturity
- Assurance
- Protection

people sit within the lines of business to drive the message around using data, and act as local agents for change. They are crucial to build a strong data culture within the organisation on an individual and department-level.

A CDO builds trust in data

Trust in data varies across business units, depending upon their maturity, the level of change taking place and external compliance being common factors. Organisations are now taking an approach where data is also considered a product, just like any other platforms or applications. By mapping out data as products and having a set of trusted APIs where each one is identified and maintained for a specific purpose, we build trust and credibility. Take, for example, stock data which is key to a number of sectors such as retail. Every retailer has data sources for stock that it sells - including stock data for financial reconciliation, warehouse and inventory, customer-facing (e-commerce vs store vs display), replenishment and availability in-store. This data proves valuable when analysed and used in the right way. CDOs are key to this, championing data-led decision making and developing their peers' trust that data insights are correct and useful.

Another aspect of building trust in data is the implementation of strong data governance and management processes. In doing so, people can expect the data that they are using to be good quality, timely and have accurate records of any alterations. Again, a task that falls under the CDO's remit.

Business discovery

This area is focussed on treating data as an internal and external product, driving business engagement, and getting a very good understanding of the business and how data can facilitate change and improvements in the organisation. Roles within this section include Product Managers, Business Engagement, and Business Analysis.

Product managers

A Product Manager takes the organisation's requirements and translates it for the data science and engineering team. The bridge between the company and the programmers, data scientists, analysts and engineers. They get-to-grips with the business' requirements and relays those to the rest of the data team. Plus, they help to identify or find out the potential outcomes from projects, changes and investments and ensure prioritisation of the most valuable pieces of

work for the teams to focus on. Product managers are obsessed with tracking results from changes made and feeding back progress and results from the data team to the rest of the organisation.

Business engagement

This role helps to ensure that the organisation is truly engaging with the data, insights, metrics and outcomes from analytical solutions. Without engagement you get no action, and without action you get no change (or at least no managed, controlled, desired change). You can think of this role as change management as it's focussed on ensuring that positive change happens and people understand it and are prepared for it.

Business analysts

Business analysts help to understand and improve processes and systems within organisations. They conduct research and analyse an organisation's current processes to identify problems that can be fixed through data. This knowledge feeds into the definition of data requirements, business rules, metrics and KPIs and how downstream processes need to change. They then work with the wider data team to introduce these solutions to the organisation.

Solution Delivery

This is the implementation team responsible for delivering a data strategy and different projects within the organisation. It encompasses the following roles: Architecture and Design, Data and Software Engineering, Analytics and Science, Visualisation, Support and DevOps, and Testing.

Architecture and design

Data architects determine the structural requirements of data storage by analysing the organisation's operations, applications, goals, current systems and programming. They own the design of the end-to-end data and analytics platform and how it links together from data capture through to insight. Importantly they ensure that integration of data between various systems is designed so that analytical outputs can be shared into line of business applications.

Data model, data mart and data warehouse design also sits here which is where data structures are designed to make it more easy to consume.

They care that practical and scalable solutions are designed to meet specific and organisation wide requirements.

Data and software engineering

Data engineers are responsible for managing, optimising, overseeing and monitoring data retrieval, storage and distribution in the organisation. They help to make raw data more useful for the organisation. Their role spans the organisation because they require an understanding of the wider business and departmental goals to ensure that data is prepared effectively for it. They work closely with the architects to ensure that solutions are being built according to the design.

Analytics and science

The Data Scientist

Data scientists are responsible for building models and algorithms from which insights can be uncovered from massive amounts of structured and unstructured data to help shape or meet specific business goals. They use a range of research, mathematical and scientific methods to unpick problems. The data scientist role is becoming increasingly important as businesses rely more heavily on advanced data analytics to drive decision-making and lean on automation and machine learning as core components of their IT and business strategies

The Data Analyst

Data analysts and data scientists work closely together to uncover insights from data. They are focussed on identifying the stories and insights that the data and models are showing and helping to relay that back into the organisation for action to be taken. Not all insight requires advanced mathematical thinking or modelling and as such the analyst is able to work with data and find insights through querying and visualisation.

How to set-up your data scientists up for success

Getting value from analytics is crucial for companies who want to monetise their data and become more data-driven. However many find this difficult. Indeed, the failure rate of analytics projects remains distressingly high (up to 85% according to research) [2].

Effective management of data scientists can facilitate success. There are many different types of data scientist (from ones specialising in computer science or statistics, to others with marketing experience or a science background). Knowing the differing styles and strengths of each data scientist on your team will set them up for success.

It's important to think about how you want your data scientists to contribute to business outcomes, and then put them in locations where they can do so. For example, to improve marketing efficiency, embed your data scientists in the marketing department. If you want to drill oil wells more effectively, put data scientists on your oil rigs, close to the action.

If it's revolutionaries in pharmaceuticals that you're after, place your data scientists in the laboratory. Each data scientist's background and experience also has relevance to whatever project you have planned. Even when you're getting started in your data efforts, pick one specific objective and position your data scientists to pursue it.

Data visualisation is an important part of gaining insights from data. It helps foster a data culture within an organisation and develops data literacy in non-data teams. Through data visualisation, previously inaccessible datasets and analysis can be 'brought to life' through infographics, graphics, animations, charts and other imagery. As such, data visualisers are natural storytellers and creatives. People who can drill down into the messages behind data and put those messages front-and-centre through imagery. An inspiring example of data visualisation can be seen in the many works of David McCandless and Information is Beautiful.

DevOps

DevOps (Development and Operations) is aimed at simplifying and shortening the software development process in order to allow more frequent software updates while trying to mitigate risk of error and maintain high standards of quality

DevOps, or more specifically in the data world, DataOps, is therefore a tight collaboration between development and operations to reduce the overhead and speed of taking solutions out of a development and into a live environment for wider consumption or use.

DataOps is a convergence of DevOps principles that have been in place in software engineering for a while, lean manufacturing principles (to build data as a pipeline) and agile project delivery principles.

You'll need someone to own this methodology and associates tools, processes and people.

Testing

This team tests the robustness of different processes or systems set-up by the team or ensures the trustworthiness of the insights generated. Importantly reconciliation testing of results produced versus expected results is critical to ensure outputs can be trusted. They also quality control outputs and double-check that insights align with the project and business goals.

Governance

This critical function assures the organisation that it can trust its data and any insights generated from it. It includes Data Governance, Data Stewards and Data Security.

Data Governance

Data Governance is responsible for the implementation and oversight of the organisation's data management goals, standards, practices, process, and technologies. They work to streamline how data is collected, shared, used, protected, cleaned and stored. Additionally, they keep the data congruent with business goals and maintain the accuracy and useability of data.

Data Stewards

These individuals are responsible for ensuring that data within their ownership is high in quality, governed well and processes adhered to. Their specialist role incorporates processes, policies, guidelines and responsibilities for administering the organisation's data in line with legislation such as GDPR and data policy.

Data security

This team protects and secures data from misuse or data leaks within the organisation and externally. They ensure that no unauthorised access occurs and that data is handled securely by the data team and wider organisation. They build and maintain security systems and processes, and test the robustness of such systems on a regular basis.

A note on team size

The size of your team will depend on the capabilities and skills of each individual hired, plus budget and other resources. Despite separate roles being listed here, individual team members can take on several of these. A business analyst might be involved in business engagement, whilst data stewards may be responsible for data security.

Organisational design and operating model

When it comes to organisational design there are a variety of methodologies. Business leaders can decide on building a centralised, distributed or hybrid team. The right choice depends on your organisational setup, strategic objectives, culture and relationship with other departments and stakeholders.

Since each organisation is unique and change is constant, continual reassessment of needs can give you the leading edge. Despite the differences in approach, there are some common best practices that can help your organisation get more from its investment, regardless of size, industry, or budget. Here are a few things to consider:

CENTRALISED
control, cost and conformance
Centralised teams usually form out of a greater desire for control and oversight on costs.

DISTRIBUTED
vision, value and velocity
Distributed teams form because of a drive for speed and concerns that centralised teams cannot collaborate effectively enough to deliver work quickly.

ORGANISATIONAL DESIGN AND OPERATING MODEL

HYBRID
A combination of centralised and distributed
Hybrid teams occur because most businesses are a spectrum - not either/or. Most organisations will have a hybrid formation with a central team and additional "satellite teams".
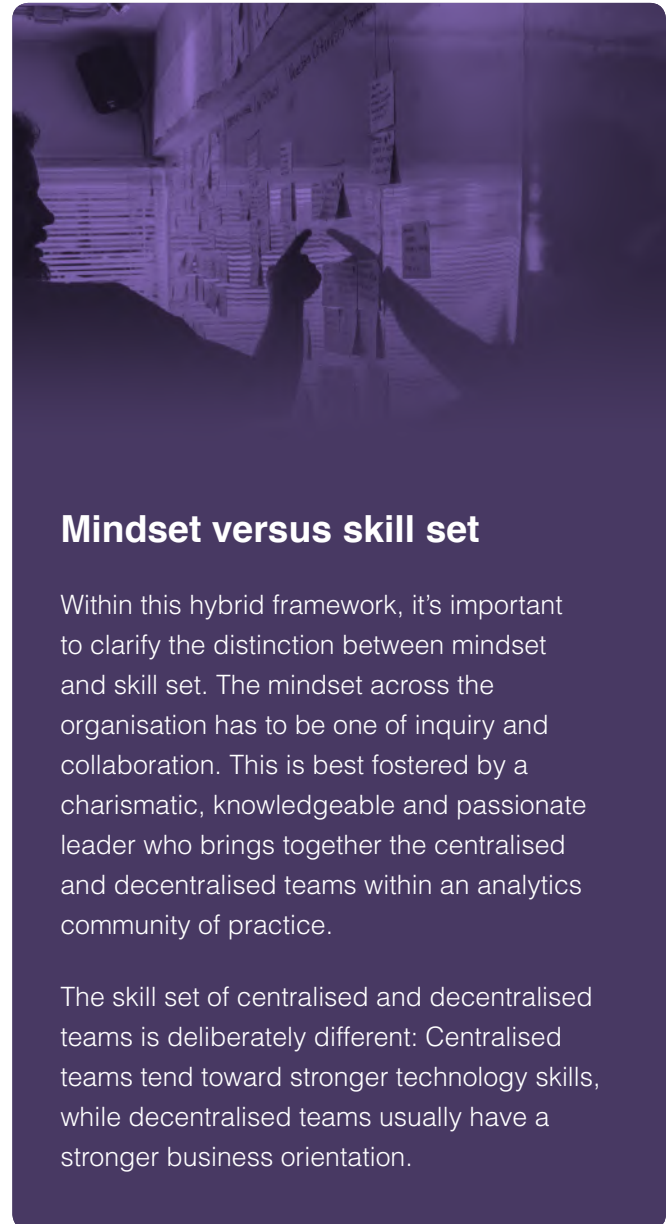
Centralised

The drivers for centralised teams are usually control, cost and conformance. Control stems from a real or perceived weakness related to regulatory compliance or the presence of a talented and strong-willed executive who is passionate about a specific direction for analytics. Conformance is usually an issue in organisations that are going up the analytics maturity curve. Initially, the aim is to standardise data sources; this is followed by a desire to conform to data definitions, metrics and processes. Cost is always a concern when organisations believe that they are not getting the appropriate business value from data and analytics. Centralisation helps an organisation more completely understand its total cost and then attempt to reduce these costs by exploiting synergies and reducing redundant work.

Distributed

The drivers for distributed teams are usually vision, value and velocity. Business executives feel that data and analytics are an important component of creating the business strategy. This vision of the strategic imperative for analytics cannot be realised unless the analytics function has a deep understanding of the business drivers and priorities. Similarly, the creation of value from analytics is an immensely collaborative process requiring interdisciplinary action that is usually hampered by the bureaucracy entailed by a centralized organization. Finally, the business is very concerned that a centralized analytics team is not able to collaborate and create deliverables at the velocity that the business desires.

Hybrid

Ultimately, centralised analysts or distributed teams aren't an either/or decision. It's a spectrum—and often one that mirrors the business itself. Take Uber, for example. It's known to be a distributed company, with regional managers empowered to do make their own strategic decisions. However, data analysts are specializing in areas like finance, policy research, and safety, or being distributed to international markets. These "satellite teams" can build up domain knowledge that provides context for their analysis, leveraging the rock-solid foundation the centralized analytics team has put in place.

Mindset versus skill set

Within this hybrid framework, it's important to clarify the distinction between mindset and skill set. The mindset across the organisation has to be one of inquiry and collaboration. This is best fostered by a charismatic, knowledgeable and passionate leader who brings together the centralised and decentralised teams within an analytics community of practice.

The skill set of centralised and decentralised teams is deliberately different: Centralised teams tend toward stronger technology skills, while decentralised teams usually have a stronger business orientation.

In our experience, a hybrid organisational structure is not only agile, it also creates a highly effective mindset of interdisciplinary thinking and collaboration in your data team. In a hybrid structure, it makes sense to centralise data engineering, data governance, the management and maintenance of the technology tools required for analytics, and the governance and operation of dashboards and reports. However, the analytics function that leverages the data and tools (that actually uncovers the insight that answers the business case) is best decentralised for the agile creation of business value.

How to build your data team: skills acquisition

A combination of in-house resources and consultants is typically used to build out a data team - and new hires to keep pace with today's data-driven economy. The right mix is usually a function of requirements, budget, and risk.

When you're solving a business problem or growing your business, you don't have the luxury of hiring someone straight out of school and developing them. Instead, hire a subject matter expert who can hit the ground running. That person may have to be recruited externally. However, smart companies are combining this with cultivating homegrown talent.

Recruit

Recruitment in any part of the business can be a challenging task and it's important to manage expectations up front. Many of the typical roles in a data team are not only highly-skilled but also scarce and in high-demand. High in demand and short in supply, many data professionals command high salaries and benefits packages. Be prepared to jostle with several other companies for talented data scientists, data engineers, analysts, visualisers and

leaders. It's for this reason that hiring a contractor, freelancer or engaging with a third-party is an attractive and more viable proposition for some.

When going ahead with an in-house team, we strongly recommend that your first hire is in data leadership. Getting a strong team leader on-board will help the rest of your team fall into place.

We recommend someone senior and experienced in data leadership. Starting out with a larger team of less experienced people will be counterproductive in the long run.

Cross-Train

Instead of a sole focus on new talent, numerous organisations grow their data science and engineering capabilities by developing internal talent. A Linux Engineer can re-train as a Hadoop Administrator, for example, or a SQL developer can become a data scientist. This strategy can prove particularly effective as roles continue to shift in the future, and more roles (such as an AI ethicist) are created.

Many companies of various sizes make their first steps towards embracing data science through upskilling current employees and helping them to experiment

with cloud-based tools. Digital company Red Ventures set-up an internal data science accelerator course to help it fulfil current demands in the company for data scientists. Through the scheme, analysts identified with an aptitude for programming and statistics are trained in statistical programming, data exploration and visualization, and machine learning. They then join RV's data science department [5].

Career progression

Providing clear career progression pathways and development opportunities is good practice for all organisations and all departments. However, within data teams it is even more important as career development can offer a way to plug critical skills gap within the team. Prioritising career development also helps with retention. 93% of employees will stay with their company for longer if it invested in their careers [3]. Given the scarcity of talent within data, it makes sense to hold onto talented employees for as long as you can.

Career progression doesn't have to be linear either. More employees find themselves taking lateral career moves into other departments that are more aligned to their career goals. In this way, a data analyst may eventually train to become a data scientist, whilst their cybersecurity colleagues move into data engineering. Plus, there are a host of roles that haven't been invented yet. 85% of roles that will exist in 2030 don't currently exist [4]. A data scientist may be as interested in a new position as an AI strategist or to grow into a data leadership role.

Learning and development

Learning and development will be vital to upskilling employees to join a data team, and also in keeping an existing data team up-to-date with the latest tools and best practice. This can take many forms, from e-learning and app-based learning to training days, seminars, conferences and short courses offered by providers such as General Assembly.

On the flip-side, to gain commercial awareness many academic institutions offer placements for their data students within businesses. Oxford University has a partnership with fintech firm Strategic Blue to enhance the technology underpinning its financial products [6]. Taking part in such a scheme can inject some innovation and new thinking into your data strategy. However, your data maturity has to be at a certain level before an academic partnership will prove valuable.

Outsource

Companies are also using outside consultants to fill skill gaps and to train existing employees, which can help ease transitions. Other options include outsourcing and crowdsourcing. One school of thought is to offshore basic data activities that are repetitive, low IT, and high volume. Another option is to be open to crowdsourcing some of the analytic challenges. However, with this tactic, you have to make sure you own the IP when you create the solution.

Most organisations will consider an outsourcing solution for several reasons:

01 They're looking for innovation

02 They're looking for greater flexibility in an evolving market - flexible infrastructure is the backbone of digital organisations

03 They want to future-proof their IT investment - a key component of effective digital transformation

04 Acceleration ie do things quicker than you could with you own current team

05 Experience - depth or breadth in subject matter, technology, solutions or from other industries

06 Bandwidth - the internal team doesn't have the bandwidth to deliver all high priority requirements so can flex up without adding headcount

Joint Venture or Collaboration

Some brands find a strategic advantage through partnerships or collaboration, for example to enter new markets or test new technology. Volkswagen collaborated with Intel and Israel's Mobileye to enter the Mobility as a Service (MaaS) market in Israel[8]. It's a bold move by the German carmaker that could shoot it to the top of companies working to commercialise autonomous driving, competing with the likes of Alphabet's Waymo. Volkswagen, Intel, and Mobileye will launch a self-driving taxi service in Israel in 2019. The relationship is mutually beneficial for all parties in advancing their individual strategic aims by sharing data, technology and local market expertise to become greater than the sum of their parts.

Nielsen, Sainsbury's and Nectar Card owner Aimia have also partnered to improve the retailer's analytics capabilities and offer Nielsen more detailed data on customer behaviour. It is hoped that through the collaboration, retailers will gain more insights on the online and offline customer journey from discovery to purchase. Something that has previously been disjointed because of siloed or a lack of data [9].

Acqui-Hire

Some organisations acquire skills in-house by buying the company that has hired them. Instead of recruiting each individual team member, they get a ready-made team that have existing experience of working together.

In 2016 Uber acquired a self-driving trucking company for $680 million in stock along with an agreement that included giving the company 20% of its trucking profits. While Uber has made investments in both self-driving technology and delivery services, the company has largely focused on moving around people, food and small items. Their strategy did not include entering the road haulage business or creating a logistics platform for truck drivers. But the acquisition

Improving data literacy in your organisation

Improving the overall data literacy of all employees further cements the success of your data strategy. A basic level of data literacy is required to understand how to use data effectively and to make data-driven decisions. It is also key in governing data and ensuring employees use it safely (and ethically) as part-and-parcel of their job. Educating a checkout assistant on the importance of accurate data collection can ensure that any information collected at point-of-sale is inputted correctly. Similarly, training a marketing team in basic data interpretation and analysis can take some pressure from a centralised data team.

Plus, it makes it easier for you to cultivate homegrown data talent. Someone in another team may demonstrate an aptitude for data analysis and an interest in transferring to the data team. Potentially plugging a skills deficit in the organisation. M&S has a data science academy that offers its employees an 18-week course. Through it, they gain a better understanding of machine learning and the programming languages R and Python [7].

gave each company a way to accelerate the development of autonomous driving into commercial reality:

For Otto - the opportunity to accelerate its path to market was one that it couldn't refuse. With the brand value and resources of Uber to achieve its ambitions.

For Uber - the opportunity to buy proprietary autonomous technology that can be retrofitted into vehicles, combined with a new leader (in Anthony Levandowski) and a highly effective self-driving data technology team. As an Uber subsidiary, Otto can continue to focus on getting self-driving trucks on the road and building out a logistics platform. But Levandowski — the original architect of Google's self-driving cars — will now be leading all of Uber's self-driving efforts, which includes Otto.

Creating A Data Culture

A data-driven culture is a workplace environment that employs a consistent, repeatable approach to tactical and strategic decision-making through emphatic and empirical data proof. Put simply, it's an organisation that makes decisions on data, not gut instinct.

While intuition has its place, the wide availability of analytics has elevated objective decision-making to the new standard, and it's the CDO's responsibility to help organisations embrace it.

The shift can be complex, requiring departments and functions to replace longstanding processes with new ways of working. The first step involves priming the organisation for change.

We recommend a three-pronged approach to guide objective decision-making:

01 Encourage employee use of data

02 Engage with employees on the possibilities of data

03 Educate them on how to manipulate and use data

Why a data culture is important

Young companies often have an inherent advantage over their longer standing competitors in that many were born from data. These businesses are based on metrics and interrelated facts. Sharing data is part of their DNA.

7 Ways to Develop A Data Culture

◎ Focus on the "art of the possible".

♟ Elevate the conversation to focus on strategy

🗺 Map your organisation's data supply chain.

🔍 Be transparent about data.

⚙ Identify areas of friction within the organisation

🏆 Develop reward-sharing mechanisms.

💡 Innovate

Traditional institutions view data differently. Born offline, they see data as a tool to run their businesses, not drive their strategy. They prize experience and intuition over data-based decision-making.

The differences are stark, and so are the results. Companies that rate themselves ahead of their peers in their use of data are three times more likely to rate their financial performance as more advanced [10].

Focus On The Art Of The Possible

Awareness of data's flexibility is the hallmark of any data culture. It leads to what we call the "art of the possible" — that is, a knack for spotting alternative uses for data.

For employees, understanding data's versatility means acquiring new habits. For instance, departments and functions regularly encounter data for which they may have no use when looked at through the lens of their own line of business. In most companies, the data is then forgotten or discarded. By viewing the same information within the context of a data map, however, other uses for the data emerge, such as links to upstream and downstream consumers. The data's potential to create new insights, and in some cases alternate paradigms for business strategies, becomes apparent.

Consider ways your organisation can find alternative or unusual uses for the data it creates. By encouraging employees to identify other departments or teams that can benefit from data, your organisation promotes and invests in its data culture.

Focusing on the art of the possible can lead to the corporate nirvana of data monetization. Netflix, for example, devised its Emmy-winning hit show House of Cards by gathering routine viewer data and carefully correlating it in new ways. The streaming service discovered that subscribers who watched the original BBC series of the same name were also avid consumers of movies starring actor Kevin Spacey or directed by David Fincher. When Netflix licensed the BBC series for a remake, it signed Spacey to star and Fincher to direct.

Elevate the conversation to focus on strategy

A data culture offers many positive benefits, such as greater employee engagement and higher productivity. But its real purpose is to focus on corporate strategy and drive innovation. Openly discussing strategies and innovation goals provide employees with a clear view of data's role in the company's overall mission and reinforce their connection to the larger organisation.

Often, traditional business models fail to make that link. Employees might be reluctant to share data because they don't see the value of data they create or are unable to connect it to the wider organisational objectives. Self-preservation can also fuel a reluctance to share, as employees often feel defined by the expertise that they bring to the table.

A deeper understanding of the bigger picture can inspire more prolific sharing by employees and foster a sense of belonging. Uniting employees at events such as enterprise-level ideation sessions and hackathons can accelerate strategy and innovation efforts. Appliance-maker Whirlpool attributes most of its innovations to structured ideation sessions. Facebook famously hosted monthly hackathons during which employees could work on projects unrelated to work. British Airways assembled writers, designers, entrepreneurs and programmers to find ways to enhance flight arrivals. Charity DataKind collaborates with social impact organisations that have little-to-no data team in-house to run hackathons tackle issues in education, poverty, health, human rights and the environment.

Greater transparency regarding strategy and innovation also prepares your organization for the data culture (and workforce)of the future. By 2025, millennials will account for as much as 75% of the workforce, and their values are expected to create profound shifts in corporate goals. For example, two-thirds of millennials would prefer to earn $40,000 a year at a job they love rather than $100,000 a year at a job they find boring [11]. Retaining their loyalty within the data culture is key.

Map Your Data

Departmental silos of information are the nemesis of thriving data cultures. To promote the view of data as a flexible asset that can be used by multiple departments, employees must see the bigger picture. You can help them by educating everyone on how their daily data use ripples through other parts of the organisation. A data butterfly effect, in other words.

Mapping your organisation's data supply chain is a useful tool for gaining that 30,000-foot view. For CDOs, it's an essential step. The map tracks each data set's path through the organisation, tells you who has created the data, who consumes it, how they use it to make decisions, who stores it and who may be misusing it.

Maps can be drawn for data sets that are used by individuals or groups, and then linked back to business processes.

The data supply chain map becomes a framework which everyone can refer to. It provides context for how data is used and how an employee's data usage fits into the broader enterprise.

Data maps can also uncover "dark data," or pockets of information that go largely unstudied, such as machine data and customer service call logs. Dark data is typically difficult to integrate and analyse due to technical issues such as formatting, variety and velocity. But it can prove surprisingly beneficial. For example, reviewing machine logs from dispensing units with geolocation data can help predict inventory patterns and improve ordering processing to avoid loss of revenue. One online clothing retailer called Stitch Fix combined its dark data with a customer survey to get greater detail about attire preferences. As a cautionary tale, another company spent $6 million searching for dark data requested in a court case, highlighting the need for dark data to be classified and managed like other data sets [12].

Be Transparent

Data becomes an asset only if its accuracy is trusted, its provenance is well established, and its security is safeguarded. But data also requires openness, even as it is protected from fraudsters and kept private for regulatory reasons.

Organisations can build trust in data by tracking its quality and lineage and providing multiple use cases, including examples in which a data set shouldn't be used.

Transparency even extends to data with accuracy issues. When confidence in data quality is low, or the data's lineage cannot be established, suggestions for specific use-cases can enhance its value.

A data set on customer spend with missing birth data and address information may render the data useless for personalisation. However, it is still viable for insights that are drawn with a broader brush, such as understanding customer segments and spending habits.

Identify areas of friction within the organisation

Creating a data culture hinges on a thorough understanding of how the departments within your company function — and where there is disconnect and contradiction.

A thriving culture is built on an environment where everyone can share information without being perceived as negative. For instance, tension can often exist between product engineering and sales. Engineering's objective is to freeze requirements so it can get products to market on time and within budget. Meanwhile, sales wish to meet its goal of boosting revenues and therefore prefers a more iterative approach to product development. With sales funnelling requests to engineering as-and-when it learns about them from customer discussions.

Data gives the two departments common ground. By using data to prioritise features, teams can objectively choose between time to market and cost. Data improves collaboration as it keeps the departmental focus on facts, not emotions.

Shared Vision (and rewards)

Sharing data successes and celebrating the individuals and teams behind them is essential to promoting a healthy data culture. To help spread the word, organisations can use a communications strategy to recognise such success.

Recognition can occur in many forms, including videos, blogs and special gatherings, such as lunches. Setting up a company portal to highlight data successes is another option. Rewards and recognition for data initiatives can be included in formal corporate excellence programs.

We recommend aligning any data initiatives with your organisation's wider innovation objectives. Does your organization want to differentiate itself by understanding its customers in new ways? By penetrating new markets? The data initiatives support those efforts and reward the ones that advance them. In this way, a cinema chain looking to improve ticket sales would reward the team and individuals who identify data that can be used to predict customer intent-to-buy.

Mechanisms for bringing people together

Getting all business departments together to better understand data, be more transparent about business objectives and help data teams collaborate is important to developing a data culture. Here are some approaches that we have found to be useful in gathering teams to share data culture.

Lunch and learn - Lunch and Learns can serve as a platform for teams to explain their responsibilities. When people understand what their colleagues do on a day-to-day basis, they will have a new appreciation for everyone at the organisation and understand where they fit in.

Demonstrations - Also known as show-and-tell, demonstrations are an important agile practice that allow teams to showcase their work and educate others on their learnings.

Away days - Stepping out from the usual workplace environment can often inspire new ideas and ways of working together. In this way, away days offer unparalleled opportunities for team-bonding, reinforcing employee commitment to business goals and innovating.

Diversity and Inclusion

Increasing the diversity of your data team offers clear bottom-line advantages in product development, creativity and use of data sets. Having differing experiences and backgrounds on a team can help with problem-solving, for example.

Beyond this, diversity can also relate to a mix of professional backgrounds. A great data team has people from all walks of life, that have worked on many different projects. Someone from a computer science background, for example, will have different insights to a statistician. There is no single person who will have all the skills for success with your data. It's very much a team effort.

Plus, there is the drive to increase diversity around artificial intelligence (AI) and machine learning projects. This helps to prevent unconscious bias being introduced to an AI through limited background and experience. A diverse team includes people from many different academic backgrounds, genders, orientation, abilities and ethnicities. Organisations may be limiting an already limited talent pool by considering candidates from conventional or similar backgrounds. Only 15% of data scientists are female, with 26% working in a predictive analytics role [13] and just 4% of data science students at General Assembly are black, for instance [14].

Consider an immigrant who speaks accented English, a cisgender female with anxiety or a black homosexual male. We will all make assumptions when meeting these, and other, people. Some of these will be based on previous experience and others because of unconscious bias. However, the ability to see our differences and explore our biases is the foundation to building an inclusive data team.
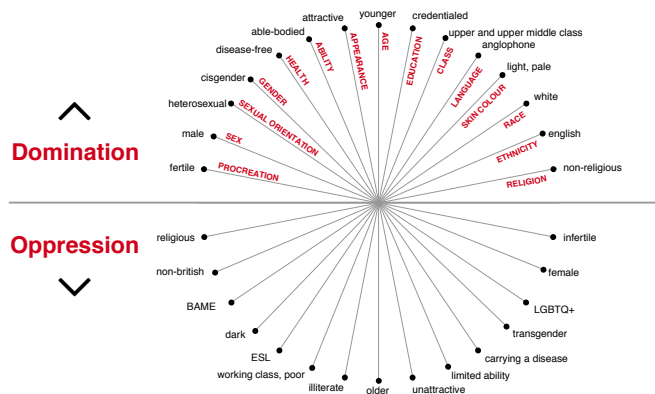
Strong data teams are ones with varied backgrounds, from statistics or science backgrounds, different ethnicities, genders and sexual orientations. Variety builds better algorithms because of the diversity of experience, drivers and priorities. It leads to more innovative thinking. An MIT study into successful teams discovered that they had three things in common: they gave each other time to talk, were sensitive to each others' experiences, views and feelings, and had more women [15].

Increasing diversity in data is a cross-collaborative effort, of course, with education, Government and industry addressing the challenges facing it. For your part, to increase diversity in your organisation there are some easy steps to implement in recruiting, promotion and career development.

How to build diversity into your data team

When building diversity into your data team, it's worth beginning with a foundation in how society generally views different aspects of diversity. A diverse workforce includes various appearances, genders, sexualities, ethnicities, socioeconomic backgrounds, education, religion, abilities and health. Some characteristics, such as upper middle class, white and cisgender, are viewed more favourably than others (like female, non-British, transgender).

The ability to recognise the intersectionality of identity - to uncover unconscious bias and understand how individuals with different characteristics of diversity may experience alternate levels of privilege in society, forms the critical foundation to building inclusive teams and culture.

1. Create an inclusive work culture

Diversity starts with your culture. This begins at the very top, fostering a sense of inclusion and belonging throughout the organisation. If the desire to build a diverse culture stems from leadership, it becomes a priority in every department and at every level.

2. Expand your recruiting pool

Explain to any third-party recruiters or in-house hiring managers why your organisation sees diversity as important and your priorities for boosting it. Setting a diversity quota can help, but may backfire if candidates are screened solely on those characteristics. Instead, help your recruiters understand that candidates from all kinds of backgrounds are suitable, as long as they are qualified and show the right skills and experience.

For instance, a number of leading organisations, including - Microsoft, JPMorgan Chase and SAP - have specific programs in place that focus on employees who are considered to be on the autism spectrum [16]. Whilst these employees may experience challenges in relating to and working with their wider team, their analytical and systematic mindset can prove of great value.

These employees might not be extroverted, but their analytical and systematic mindset can be of great value to a team.

3. Think about your hiring materials

Blind recruitment can help remove unconscious bias from your hiring process. This practice takes away any personally identifiable information from CVs such as names, gender, age, and education. Deloitte, HSBC, the BBC and law firm Clifford Chance are organisations using this tactic to improve diversity [17].

Promoting diversity in practice: Sky

sky

Sky is currently working towards a 50/50 gender split among its managers, with 40% of senior management roles currently occupied by women. An increase of 10% compared to 2015, due to a strategic approach taken by the company to improve diversity [19]. There are three ways that Sky is improving its gender balance:

Levelling the playing field by creating 50/50 shortlists for all roles.

Developing its Women in Leadership Sponsorship and Development programme.

Targeted marketing for female candidates.

Critically, this initiative is spearheaded from the very top, with group CEO Jeremy Darroch leading the change.

Innovating the Internet of Things (IoT) with diversity

Next Big Thing, a German IoT company-builder looks to its diverse network to promote innovation. Its hub connects entrepreneurs and developers from a multitude of backgrounds (professionally and personally) to collaborate with each other.

Its current roster includes people from South Africa, Turkey, Poland, and Russia. By uniting people from a range of backgrounds, Next Big Things helps entrepreneurs better understand how their IoT products might be received by customers across the globe [20].

Gender-neutral job adverts can attract diverse candidates at the start of your recruitment chain. Male-biased words such as 'lead' and 'dominant' are found to put-off female candidates. UK job adverts currently use 17% more male-led words than female ones. This has declined from 27% in 2014, however, there is still progress to be made [18].

4. Have a diverse interview team

It's crucial that the interview teams are also diverse. Because of unconscious bias, people can hire others that they relate to - that look like them, think like them and have similar education and social networks. Diverse interview teams increase the likelihood of hiring a broad range of talent.

Coming full-circle: using data to manage teams

In a virtuous cycle, building an effective data team can impact other team performance across your organisation. Team performance can be analysed to better understand what makes an effective team, to identify team-members who may benefit from extra support and to identify skills gaps. Recruitment also benefits, with machine learning assisting in reducing bias, streamlining the interview process and analysing candidate profiles.

AI in recruitment

AI-powered assistants

In recruitment, AI-powered assistants can help to reduce time to hire and increase the number of candidates who complete the application process. It can analyse CVs to assist with shortlisting candidates or review a candidate's entire online presence to determine if they'd be a good fit for a team.

AI also plays a role in interviewing from screening candidates through questionnaires, to taking part in Skype interviews [21]. The end result is a more efficient recruiting process where AI does a lot more initial groundwork. This frees up recruiters to focus more on the cultural fit of candidates.

AI for building relationships with candidates

AI email assistants and chatbots can keep candidates engaged and provide information throughout the recruitment process. Candidate relationship technology Beamery builds relationships with passive candidates in the recruitment chain. Reducing hiring cycles and creating a 'single candidates view' for employers. It can also recommend the best times to contact candidates [22].

Reduce the risk of unconscious bias

Analysing CVs and creating a shortlist based solely on skills and experience can prevent unconscious bias at the start of the recruitment process. AI can also help write job adverts using gender-neutral terms. Texio is one AI assistant that does this, increasing the number of qualified and diverse candidates that will apply as a result [23].

AI in performance management

Employees create data throughout their working day. Analysing this information provides insights on team performance that can be used in employee feedback, training, recruitment and identifying employees who require more support or are likely to leave.

This enables employers to be proactive in engaging and retaining their workforce. If an employee is identified as likely to leave, managers can step in to understand why and see if there are actions that will retain them. If another is flagged for high-stress behaviour, their line manager can have a chat with them to see what is happening and how the organisation can support. Data may uncover someone who would benefit from more training or suggest next steps for career development.

BNP Paribas used biometric data from wearable devices to track employee stress and wellness. It discovered that employee stress levels reduced when BNP Paribas encouraged them to use a breathing and meditation app. High rumination (consistently worrying about work outside of office hours) also decreased. The company envisions that the data collected can one day be used to respond to employee stress before sick leave or a GP referral occurs [24].

However, we recommend that any use of employee data is well-informed and opt-in. Employees at BNP Paribas chose to take part and understood how their data was used. Employers that use data for oppressive oversight, without permission from employees, may negatively impact employee morale and productivity. UK newspaper The Telegraph discovered this when it installed devices to monitor the time its employees spent at their desks - without their permission [25].

Creating a data team for the future

To ensure the future success of your data strategy, find the best people for your data team. This begins with an effective leader. With your data leadership in place, the rest of your team are much easier to resource and hire.

There are several ways to obtain the right talent, from hiring in-house to using freelance talent or third-parties. Organisations can choose the right format for them, dependant on budget, project length and skills available. Because of the widening skills gap, the best option for some organisations is using a third-party.

Improving the diversity of your recruiting pool is another way to address the skills gap - and boost innovation within your data team. It makes sense to consider all possible candidates, from every background, gender, orientation, education, ethnicity and so forth. Data talent is already scarce - don't limit yourself further.

Using data and AI can help improve unconscious bias in your hiring processes and recruit more diverse candidates. Of course, this is a bit of a chicken-and-egg situation, as your data team has to be in place before you can undertake any kind of employee analytics.

Whatever your data resourcing requirements, it is a process that is as vital as defining your data strategy. All good plans can be undermined by a lack of skilled people to implement them. Set your organisation up for success by focussing on your team - hiring the right people, retaining skilled talent and nurturing from within.

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cynozure

A data and analytics strategy consultancy, Cynozure is on a mission to change the way business is done through positive use of data.

In collaboration with forward-thinking organisations, governments, and individuals Cynozure advises - and delivers on - all aspects of data and analytics strategies. This is achieved through advisory services, coaching and mentoring, solution and organisational design, technology implementation, business change programmes, and on-going support services.

Cynozure's team and associates are thought leaders and experts in this space. Many have a background in industry, and frontline experience of what is required to create leading data-driven organisations. Now they have a united goal: equip leaders and their organisations with the ability to understand and leverage their data. Cynozure will help identify the value that exists within data, and how it can be used to transform business strategy, products, services and operations. There is a clear focus on ensuring that incredible business (and social) value is delivered, to maximise the transformational power of data across society.

Organisations that have benefited from Cynozure's approach include The National Trust, Soho House, Tokio Marine Kiln, MSD, The Really Useful Group, Camden Council, Lloyd Webber Theatres, Kondor and Tungsten Network.

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