FUTURE OF DATA

DEMOCRATISATION

Unhidden figures

It's the business buzz phrase of the moment, but is 'data democratisation' such a good idea when so many of us find it hard to deal with statistics?

Josh Sims

It was Clive Humby, the mathematician and data scientist behind Tesco's Clubcard, who coined the phrase "data is the new oil". It has since become something of a corporate cliché, uttered by every consultant and CEO who wants to show how deeply they understand the digital economy.

For Ved Sen, head of business innovation in the UK and Ireland for Tata Consultancy Services, this maxim doesn't quite ring true. He would instead describe data as "the new plastic", because "we create a lot, we struggle to know what to do with it and it tends to turn up in the wrong places. And, for all the talk about the democratisation of data, business is not yet culturally geared up to handle this. There's a lot to do."

Certainly, there are benefits to be had from democratisation: the relatively new school of thought that data should be made readily available in an organisation rather than being kept in silos. The idea is that this provides a basis for more informed decisions throughout the enterprise while also encouraging innovation. Some of its proponents even claim that empowering employees by "digitising" a company, as Western Union calls it, could grant it a game-changing competitive edge.

Yet only 27% of executives surveyed by MicroStrategy last year said they were confident that they'd built the right organisational culture to support a data democracy. Indeed, the many hurdles to be surmounted in deposing a data dictatorship – aside from the obvious ones, including simply finding the time in the case of SMEs – are only starting to become clear.

Matthew O'Kane is global head of artificial intelligence solutions at tech services company Cognizant. He believes that companies need to handle the democratisation process with kid gloves. In part, this is because of the potential interdepartmental sensitivities about data ownership, especially in larger organisations. A recent multi-industry study by McKinsey found that, for teams requesting access to internal data beyond their departmental remit, the response time could be measured in months in 53% of cases.

O'Kane points to one retail bank's board-level diktat that ordered the centralisation of all data overnight but also gave reassurances that no material would be used without the consent of the team that originated it.

"The number one thing I hear from the many CEOs and CIOs I talk to is that they don't feel ready for the democratisation of data, because they don't trust employees to make the right decisions using it," he says. "There's a lot of talk of software being the solution, but technology is the least part of this. Anyone given access to data needs to be able to interpret it. Until then, it's like giving someone a black box that says 'the answer is A', to which their immediate reaction might be 'why is it A? How would I know?'. There isn't a tool to bring about this change. It won't happen overnight."

The lack of trust is part of a bigger weakness with the democratisation concept: the fact that most people struggle to deal with statistics. A recent study in the US found that 46% of high-school graduates were unable to estimate how many times a flipped coin would probably come up heads in 1,000 tosses.

"The problem, which has become clearer since the Covid crisis started, is that a lot of statistics are counterintuitive and full of surprises. That's especially the case with brains like ours, which are simply not built to be good calculators of, say, probability."

So says Stian Westlake, CEO of the Royal Statistical Society, which has found a lucrative sideline as a training provider to firms in industries such as pharma and petrochemicals. He adds: "Our brains are good at seeing patterns, but struggle to see randomness when it's there. And it's often necessarily believe what they're presented with. For instance, respondents to a 2018 survey by Experian said that they considered 30% of the data held by their firms to be inaccurate on average.

This is not the only issue of trust that affects data democratisation, according to Kevin Hanegan, a founding partner of the Data Literacy Project and the chair of its advisory board.

the case that [when it comes to data analysis] people don't know that they don't know."

This applies even in professional circles where a good understanding of data might be considered crucial. A study of 492 physicians for the *Journal of the American Medical Association* this year, for instance, found that their assessments of pre-test data led them to overestimate the likelihood of breast cancer in a patient by 976%.

Small wonder, then, that a 2020 survey by data analytics company Qlik found that only 17% of lay employees considered themselves confident in handling data. More than two-thirds (67%) of respondents admitted that they felt overwhelmed by the numbers, while 19% said they had gone so far as to find other ways of completing a task without using data.

The danger here is that there will be an expectation that lay employees possess the same understanding of data as its traditional keepers, the analysts. It's why O'Kane sees a growing role for artificial intelligence systems in filtering data into more comprehensible packages and also in checking all ensuing decisions.

"After all," he notes, "a bank manager doesn't decide whether or not to approve your loan anymore. A computer does."

This is also why education is important, according to Sen, whose company gives its employees mandatory training in certain aspects of data analysis.

"Given the sheer volume of data that's out there, it's fundamental that any business seeking to democratise data should also educate its people in using that data," he argues. "Without learning how to handle data objectively, we all have biases and will lean into our own experiences when presented with material that challenges us. This training is not sufficient at most companies, while the smartest firms are really investing in it."
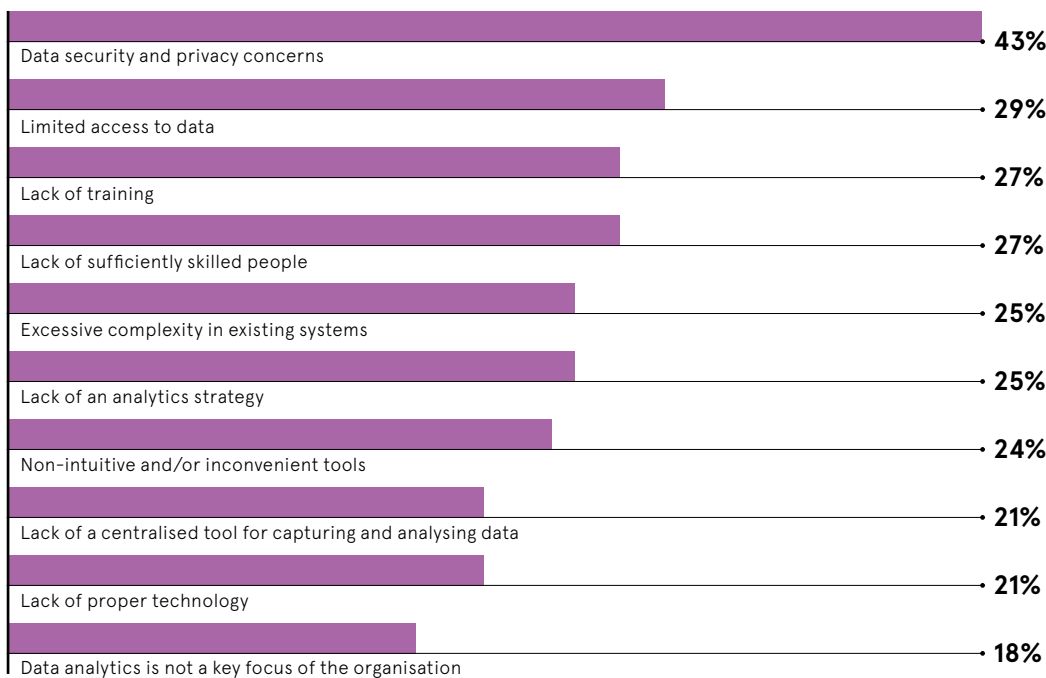
But there is an argument that, even before a business addresses data literacy, it must address its data dependency: the belief that all data is valuable, even if it doesn't help to solve any known problem.

"It's important for any business to recognise the dynamics of complexity in data – and the fact that zooming in on really critical information can sometimes be highly predictive, better so than when using all the other data that might be added," says Florian Artinger, professor of digital business at Berlin International University of Applied Sciences.

He cites the wildly fluctuating prices of airline tickets during the pandemic – a product of the data on which the industry's pricing model is based.

"Making data more widely available can empower employees' expertise, but we shouldn't be lured into thinking an idea that can be backed by data is necessarily better than one arising from experience or intuition. After all, data can be used simply to 'cover your ass' and justify inaction or a bad move," Artinger says. "What we need first is a business culture that knows not only how but when to use democratised data – and when not to." ●
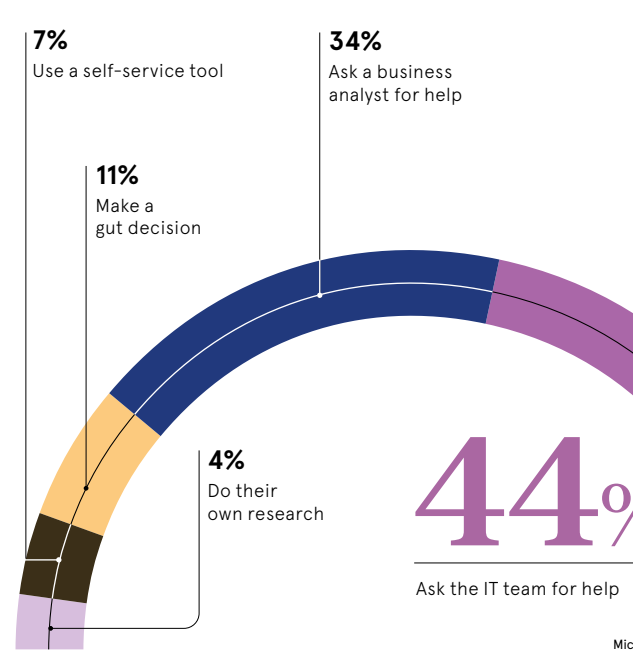
> **The number one thing I hear from the many CEOs and CIOs I talk to is that they don't feel ready for the democratisation of data, because they don't trust employees to make the right decisions using it**

Once a fully accessible centralised data store has been established, promoting it as such can be helpful, he says. For instance, AT&T rebranded its internal online marketplace, Amp, as a company-wide data hub last year. This sort of "personification can create trust in the data".

And trust is vital. When employees are offered greater access to data, they don't

THE BARRIERS TO DATA DEMOCRATISATION

Percentage of companies that say the following factors hinder their use of data

Data security and privacy concerns	43%
Limited access to data	29%
Lack of training	27%
Lack of sufficiently skilled people	27%
Excessive complexity in existing systems	25%
Lack of an analytics strategy	25%
Non-intuitive and/or inconvenient tools	24%
Lack of a centralised tool for capturing and analysing data	21%
Lack of proper technology	21%
Data analytics is not a key focus of the organisation	18%

THE DATA SKILLS GAP

What people who lack data-handling skills do when they need to make a decision based on data

7% Use a self-service tool

11% Make a gut decision

34% Ask a business analyst for help

4% Do their own research

44% Ask the IT team for help

MicroStrategy, 2021

THE IMPORTANCE OF
DATA

The amount of data created and captured worldwide is forecast to soar in the coming years. This makes it ever more vital for businesses to understand the material at their disposal, with big data analytics and artificial intelligence set to play a growing role.

THE AMOUNT OF DATA IN EXISTENCE IS SET TO ROCKET

IDC, Statista, 2021

Volume of data and information created, captured, copied and consumed worldwide (trillion Gb)

Projected volumes

2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
2	5	7	9	13	16	18	26	33	41	64	79	97	120	147	181

INVESTMENTS IN BIG DATA ANALYTICS AND AI TO MANAGE THE PROLIFERATION OF DATA HAVE BECOME ALMOST UBIQUITOUS

NewVantage Partners, 2021

Results of a survey of 85 blue-chip companies

◆ Percentage of large companies investing   ◆ Percentage of companies where the pace of investment is accelerating

Year	Investing	Accelerating
2019	97.2%	91.6%
2020	98.8%	51.9%
2021	99.0%	91.9%

COMPANIES ARE STRUGGLING TO BECOME DATA-DRIVEN ORGANISATIONS

Percentage of firms that are achieving the following with big data analytics and AI

	Driving innovation	Competing on data and analytics	Managing data as a business asset	Well-articulated data strategy	Transformational business outcomes	Forging a data culture	Creating a data-driven organisation
2019	59.5%	47.6%	46.9%	0%	0%	28.3%	31%
2020	64.2%	45.1%	50%	0%	0%	26.8%	37.8%
2021	48.5%	41.2%	39.3%	30%	29.2%	24.4%	24%

NewVantage Partners, 2021

THE NUMBER OF BUSINESSES CLAIMING THAT THEIR INVESTMENTS IN BIG DATA AND AI ARE DRIVEN BY "OFFENSIVE REVENUE GENERATION" IS DECLINING

Results of a survey of 85 blue-chip companies

◆ Offensive   ◆ Defensive

Year	Offensive	Defensive
2019	91.7%	8.3%
2020	89%	11%
2021	82.7%	17.3%

NewVantage Partners, 2021

BUSINESSES ARE OPTIMISTIC ABOUT ACHIEVING GOOD RESULTS FROM THEIR INVESTMENTS IN BIG DATA ANALYTICS AND AI IN THE FUTURE

Percentage of companies saying they expect successful outcomes

Year	Yes
2017	48.4%
2018	73.2%
2019	62.2%
2020	70.3%
2021	96%

◆ Yes
◆ No / Too early to tell

No / Too early to tell
4%
29.7%
37.8%
26.8%
51.6%

NewVantage Partners, 2021

CULTURAL ISSUES PRESENT THE BIGGEST BARRIER TO BECOMING A DATA-DRIVEN ORGANISATION

NewVantage Partners, 2021

Percentage of companies saying the following is their biggest barrier

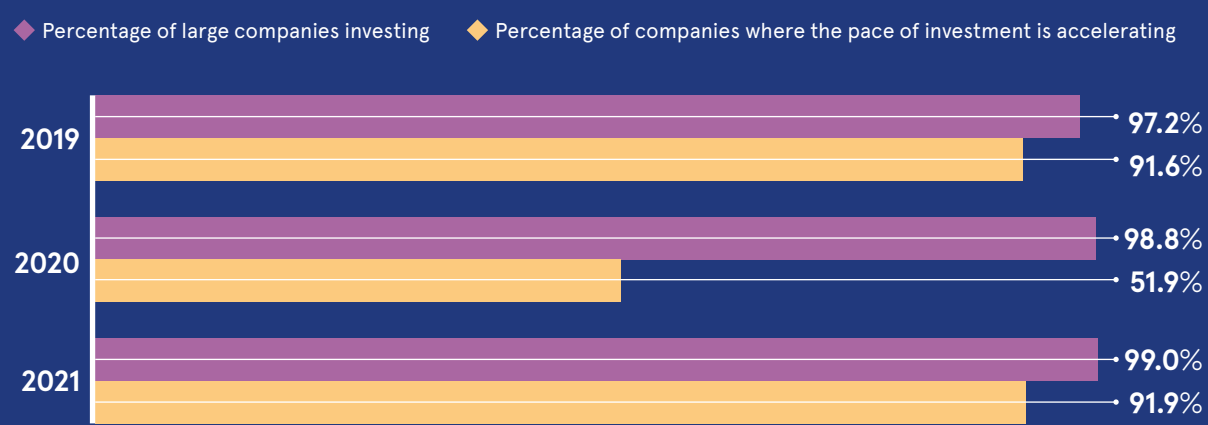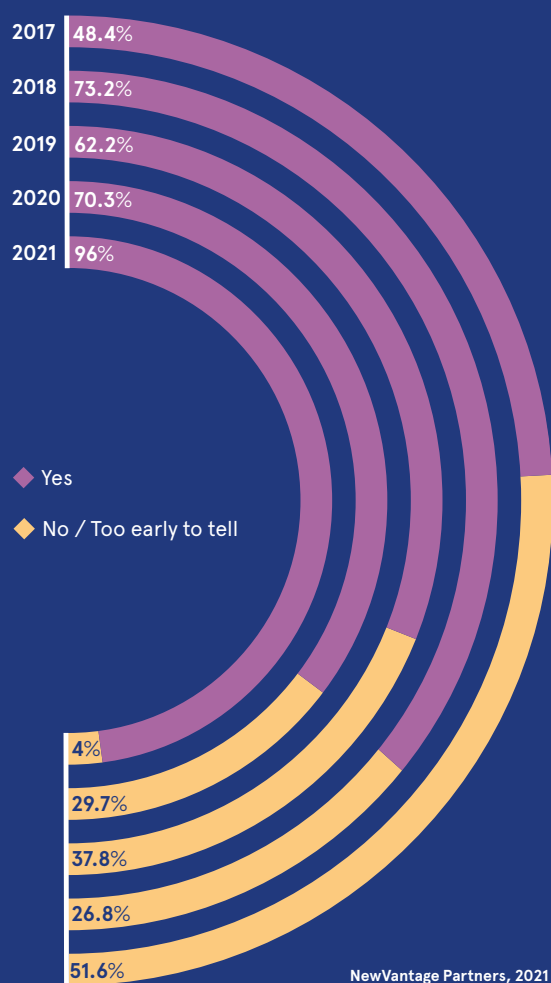◆ People/business process/culture   ◆ Technology

	2018	2019	2020	2021
Technology	19.1%	7.5%	9.1%	7.8%
People/business process/culture	80.9%	92.5%	90.9%	92.2%
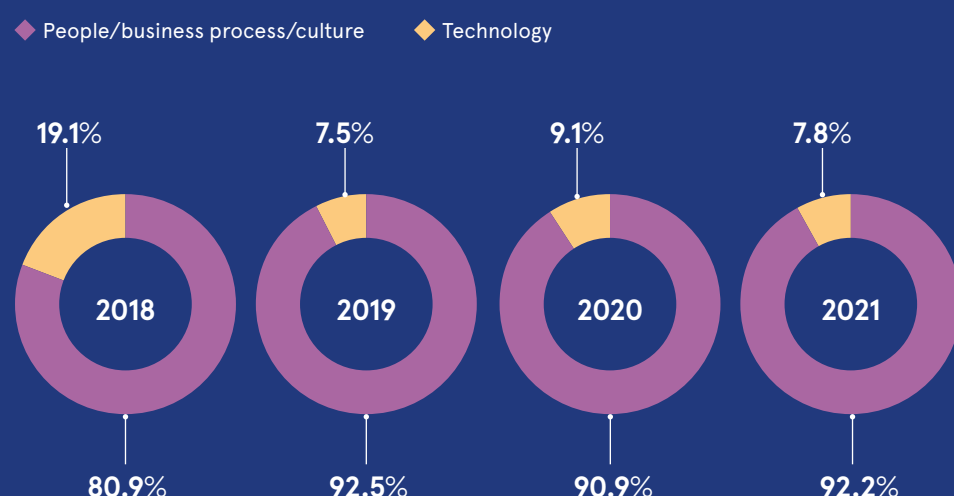
FEW COMPANIES MAKE DATA AND ANALYTICS BROADLY ACCESSIBLE THROUGHOUT THE ORGANISATION

MicroStrategy, 2020

Percentage of an organisation that has access to data and analytics

Less than 10%	10%-25%	26%-50%	51%-75%	More than 75%
5%	19%	32%	30%	14%

NEARLY HALF OF FRONT-LINE WORKERS DON'T HAVE ACCESS TO DATA AND ANALYTICS

MicroStrategy, 2020

Percentage of the following roles that have access

	Senior executives	Managers	Front-line workers
Global average	76%	81%	52%
Brazil	74%	76%	58%
Germany	78%	76%	58%
Japan	73%	90%	51%
UK	75%	80%	48%
US	81%	81%	48%

THE BUSINESS BENEFITS OF USING DATA MORE EFFECTIVELY

MicroStrategy, 2020

Percentage of organisations that said they had achieved the following through their use of analytics

Benefit	%
Improved efficiency and productivity	64%
Faster, more effective decision-making	56%
Improved financial performance	51%
Identification and creation of new product and service revenue	46%
Improved customer acquisition and retention	46%
Improved customer experience	44%
Competitive advantage	43%

Commercial feature

How changes to data privacy rules will impact small businesses

Change is in motion in the world of data privacy and those changes will have a knock-on effect on businesses that rely on third-party data to generate sales. As a result, companies may need to get to grips with a new kind of data capture if they want to survive

Consumers have over time become increasingly aware of data privacy issues and what sort of electronic footprint they have left on the internet. More and more, people are becoming interested in how much of their data is publicly available, and what it is being used for.

Following the adoption of GDPR regulation, and perhaps sensing unpopularity among consumers and potentially more regulation in the pipeline, Big Tech has decided

HOW DOES GDPR AFFECT MY ECOMMERCE BUSINESS?

80%

of The Economist's email list was lost when the GDPR hit

48%

of all ecommerce transactions are from repeat customers, so your current customer base may be your greatest asset as you deal with these changes to data privacy

64%

of UK consumers say businesses should use SMS more

to make changes to the way it operates, with companies like Apple and Google having incorporated, or in the process of incorporating, privacy features into their platforms.

Apple's recent iOS 14.5 update, which affects all Apple devices and more than 1 billion people globally, saw users asked for the first time by their apps if they could collect and share their data, with the few that chose to opt into data collection also able to opt out at any time. The change has been ground-breaking, with just 15% of worldwide users choosing to opt into data tracking, according to mobile app marketing platform Flurry.com.

Meanwhile at Google, there are plans to phase out third-party cookies by 2023. Cookies are tiny tracking codes that exist on most websites and follow users around the internet, allowing advertisers to track people's online movements and target them with relevant ads. Instead of cookies, the tech giant is testing something called Federal Learning of Cohorts, which tracks groups of people based upon their common interests, as opposed to tracking individuals.

The high-level changes made by those operating at the core of data capture will inevitably affect businesses that rely on that data to drive product engagement and sales. For example, those operating in ecommerce, whether they be more established brands or smaller entrepreneurs making use of websites like Shopify and Etsy, will be forced to change how they gather data and interact with it if they want to continue to grow their customer base.

Third-party data is information collected indirectly from a user. Often, this data comes from a variety of sources and platforms, and is then stitched together to create a full user profile that includes an individual's preferences, behaviors, actions, and interests. Businesses currently make use of this data to target personalised adverts at individuals that might be interested in their product. Until recently it hasn't been something that could be explicitly opted-in to and, even now, many of us thoughtlessly click 'yes' when prompted to do so while browsing online and in doing so opting into various privacy requirements despite not knowing the terms we've agreed to.

To adapt to the privacy changes driven by tech, affected businesses will need to move away from third-party data, and instead use first-party and zero-party data. Zero-party data encompasses information that a customer has provided voluntarily to a brand, like an email address or a phone number, while first-party data contains information observed about someone on their own property, such as which items of clothing a person is browsing for while shopping on a fashion retailer's website.

The core difference here is that first- and zero-party data are consent-driven, while third-party data isn't. An all-encompassing name for the pair could be Customer-First Data™, because those data collection methods consider whether people want to engage with brands through explicit consent. They also come with a level of trust among consumers that third-party data would struggle to emulate, as tech companies like Apple and Google aren't responsible for the repercussions of selling their data to ecommerce marketers.

Switching data capture sources for businesses that are reliant on data to drive sales

> **The most important change every marketer will have to make is around de-prioritising third-party data and instead prioritising how you collect, store and use first-party data**

might seem daunting, but, if done properly, a new approach could help to foster stronger customer relationships and leave businesses in a better position to withstand any future changes to data privacy.

Given the obvious drawbacks to maintaining a third-party data strategy, businesses are likely to have to make major changes to their data marketing strategy that will see them adopt methods that will

give them access to Customer-First Data, like targeting an interest-based audience. That could mean that affected businesses spend more time and money getting customers signed up to a mailing list, or funnel resources into better understanding data capture from their website on social media pages.

In addition, businesses are also likely to approach advertising differently as future adverts will need to be targeted at a wider audience. For example, businesses may begin to make wider use of customer testimonials and reviews, as potential new customers are less likely to trust a website they haven't used before, and positive customer feedback is likely to ease their concerns. Advertising using consumer-first data is likely also to make greater use of influencer marketing, as influencers have a wide but loyal audience, many of whom share similar interests.

"The most important change every marketer will have to make is around de-prioritising third-party data and instead prioritising how you collect, store and use first-party data," says Kady Srinivasan,

Global Head of Marketing at marketing automation company Klaviyo.

"How do you do that? You flip the funnel. You focus on collecting enough high fidelity zero-party and first-party data – data you collect directly from someone, or you collect from someone's behaviour on your site – to be able to personalise your customer's experience at scale."

She continues: "As marketers, we're told to focus on building the top of the funnel, which inevitably means spending marketing resources on big advertising networks, but with the new privacy changes coming and a cookie-less future looming, you need to evaluate your investments across the entire funnel.

"Flipping the funnel essentially means that you should throw out your classic marketing playbook and instead start building your business from the bottom up. This strategy draws on the idea that if you already have high-intent, interested users, you can further engage them to drive deeper loyalty, more repeat purchases, greater word-of-mouth, and ultimately higher lifetime value."

Q&A

with Klaviyo's **Kady Srinivasan**, Global Head of Marketing

Q: As an entrepreneur affected by the changes to data privacy, what's the first thing I need to do?

A: When you're dealing with changing consumer privacy laws, new technologies and plummeting marketing spend efficiency, focus first on building relationships with your customers.

Rather than putting large amounts of spending into third-party data platforms, focus instead on customer retention, lifecycle marketing, and re-engagement strategies at various points of the funnel (like cart and browse abandonment, cross-sell and up-sell recommendations, loyalty programmes, referral and word-of-mouth, product reviews and personalised web experiences). By leveraging these channels and the right data, you can start to de-risk your reliance on third-party platforms and all the privacy changes that are occurring.

There are also a few tactical things you can do to get ready. The first is to check your baseline metrics; gather your metrics on clicks as they are right now, so that you can track true performance when email open rates are no longer in the picture. Segmentation will also be key, meaning you segment your email and SMS lists into groups like recency of signups, purchase, on-site behaviour and email or SMS engagement – the only signs of engagement

on SMS are clicks and replies, so if you haven't implemented an SMS strategy yet, now is the time. Lastly, test and learn. Work to understand what creative is compelling and engaging and adjust accordingly.

Q: If I prioritize Customer-First Data™, is it realistic to expect to see the same sales volume as I had when I used third-party data?

A: If you're truly emphasising Customer-First Data and personalising your

> **If you're truly emphasizing Customer-First Data and personalising your strategy with your customers, you should see more sales volumes as well as more margin, return on investment (ROI) and more money to invest back into your business**

strategy with your customers, you should see more sales volume as well as more margin, return on investment (ROI) and more money to invest back into your business.

In fact, in the first half of 2021, Klaviyo's customers saw nearly 100x ROI. In other words, for every $100 spent with Klaviyo's email marketing and customer data platform they averaged almost $10,000 in return. That's all cash that our customers can funnel back into their businesses in a way that they see fit.

Q: Can you give me some practical, tried and tested tips on how to make the switch to Customer-First Data work?

A: Sure. Two really simple methods are making use of loyalty programmes and using automated emails to re-engage site visitors. We've had clients that have made use of the aforementioned methods and have seen success as a result.

Bombinate, a UK-based curator of artisanal goods, for example, offers customers a cashback loyalty programme. Customers get 5% cash back every time they shop, plus access to additional cashback opportunities. The business has obtained the Customer-First Data via the log-in required to access the cashback program, and customers can see how much they have available to put towards their next purchase.

Elsewhere, Grind, a London-based coffee brand, uses automated emails to re-engage site visitors. For those who forget to make a purchase, they send a series of abandoned cart emails, a practice that drives 41% of the brand's revenue. For customers who the business has determined are likely to run out of coffee pods soon, Grind sends out an automatic replenishment email to get customers to make another purchase. Such a strategy generates a further 19% of the brand's revenue.

Q: I'm a consumer – do these changes mean my data will be more secure in the future?

A: We hope that with brands shifting their reliance from third-party to Customer-First Data, it will be a better experience all around for customers. Not only will you be getting a more personalised experience, but you can also rest easy in the knowledge that all of the data a brand has collected on you is because you consented.

For more information visit klaviyo.com

KLAVIYO

MARKETING

Poll position

With consumer data more accessible to them than ever before, brands are making valuable discoveries about the fast-changing preferences of their target audiences

Belinda Booker

What if one tiny nugget of information could unlock a huge new revenue stream for a business? With self-service providers making access to consumer data faster and cheaper, brands of all sizes are tapping into this resource and uncovering new growth opportunities.

Consumer insights that once took weeks for a research agency to come up with (and charge thousands of pounds for) can now be at the fingertips of anyone who wants them. This democratisation of data is transforming how brands connect with their customers, enabling them to develop products and services more flexibly and create marketing campaigns that truly resonate with their target audiences.

Sometimes it starts with a hypothesis, as in the case of Bloom & Wild. During the run-up to Valentine's Day this year, the leadership team at this direct-to-consumer flower brand wondered whether giving red roses as a gift had become too much of a cliché. To confirm its suspicion, the company used research platform Attest to poll 1,000 consumers. It found that nearly 800 of them would prefer to receive a thoughtful present rather than something traditional.

"Red roses actually ranked as the least favourite gift that people had received for Valentine's Day," says Bloom & Wild's brand and communications director, Charlotte Langley. "That gave us confidence that we'd correctly sensed consumers' sentiments."

Armed with this information, the company took the bold step of discontinuing the sale of red roses and basing a PR campaign on that decision. This sparked debate across the nation and secured a 51% year-on-year increase in press coverage. It ended up being Bloom & Wild's most successful Valentine's Day to date.

For the first time ever, Bloom & Wild will not sell red roses for Valentine's Day.

Building on a revealing discovery about Barbie

As well as confirming hunches, consumer data can help brands to put the findings of other types of research into context. When Mattel, the maker of Barbie, conducted a study with neuroscientists from Cardiff University which indicated that playing with dolls helps children to become more empathic, it wanted to understand how important this factor would be to parents.

Mattel used OnePoll to survey 15,000 parents in 22 countries. This found that 91% of respondents ranked empathy as a key social skill that they would like their children to develop, but it also revealed that only 26% were aware that playing with dolls could aid this process.

Seeing a huge opportunity to educate consumers, Mattel created both a marketing campaign promoting the benefits of doll play to parents across EMEA and an online hub with resources for parents, caregivers and children. These initiatives have contributed to the company's strong performance so far this year, with market researcher NPD Group naming Barbie as the top seller in the global doll market in H1 2021.

"If you aren't actively listening to, and engaging with, consumers, are you even relevant as a brand?" says Mattel's head of insights for EMEA, Michael Swaisland. "We always aim to guide our innovation using what we learn from our ongoing engagements with kids, parents and society at large. Keeping aware of the issues affecting people across the world is a vital component of a company's success."

Turning a TikTok craze into long-term growth

Large-scale consumer research isn't only for large, well-established players such as Mattel. It can also be hugely valuable for startups in helping to propel them to the next phase of growth.

Take Little Moons for example. The ice-cream dessert brand made its first foray into consumer research when it wanted to learn more about its target market, having built a loyal gen-Z fanbase on social media.

"You might think that the people who are motivated enough to follow your company on Instagram are the same people buying most of your product," says Little Moons' marketing director, Ross Farquhar. "Our Instagram following would suggest that our audience comprises mainly women in their late teens and early 20s. Yet consumer profiling identified that the people driving most of the volume in premium ice cream are actually affluent over-30s."

This information proved crucial when Little Moons suddenly started trending on TikTok at the start of this year, with young people filming themselves shopping for its desserts in Tesco (which had been stocking the product since November 2020) and then experimenting by mixing flavours. At the end of January 2021, the brand's week-on-week sales at Tesco increased by 700%. But Farquhar and his team knew that this would be a short-lived spike if the craze remained the preserve of TikTok users.

"We recognised that, if the trend was going to translate into the business outcomes we wanted, we'd need to take what was happening on TikTok and make it accessible to people who weren't on the platform," he says. "We therefore encouraged the press to cover the story. Our theory was that, if we could get it into the *Telegraph*, the *Express* or the *Sun*, it was far more likely to become part of the cultural conversation than if it stayed on TikTok."

The considerable amount of press coverage achieved by the company helped to give its sales even more of a boost. Research conducted by Attest before and after the PR campaign found that prompted brand awareness of Little Moons had tripled among its target market.

Keeping a finger on the pulse

The pandemic has proved to be a boom time for consumer insights, as companies clamour to keep abreast of the public's fast-changing opinions and shopping habits. But, even though Covid crisis appears to be easing, brands would be well advised to keep their eye on the ball, warns Katie McQuater, editor of the Market Research Society's *Impact* magazine.

Even Mattel managed to fall short in this respect recently. The company may have made Barbie one of the most diverse and inclusive doll brands on the market, but it attracted unwanted publicity in August after it released a collection themed on the Tokyo Olympics that didn't feature a doll that appeared to be Asian.

"To determine whether changes in consumer attitudes and behaviour are fleeting or indicative of a longer-term trend, businesses should maintain their investments in insight and put research at the forefront of their decision-making," McQuater says. "The fact that some are still making high-profile missteps reinforces the need to ensure that your strategies and communications are backed by data on what consumers are thinking and doing." ●

Jovanto Productions via Shutterstock
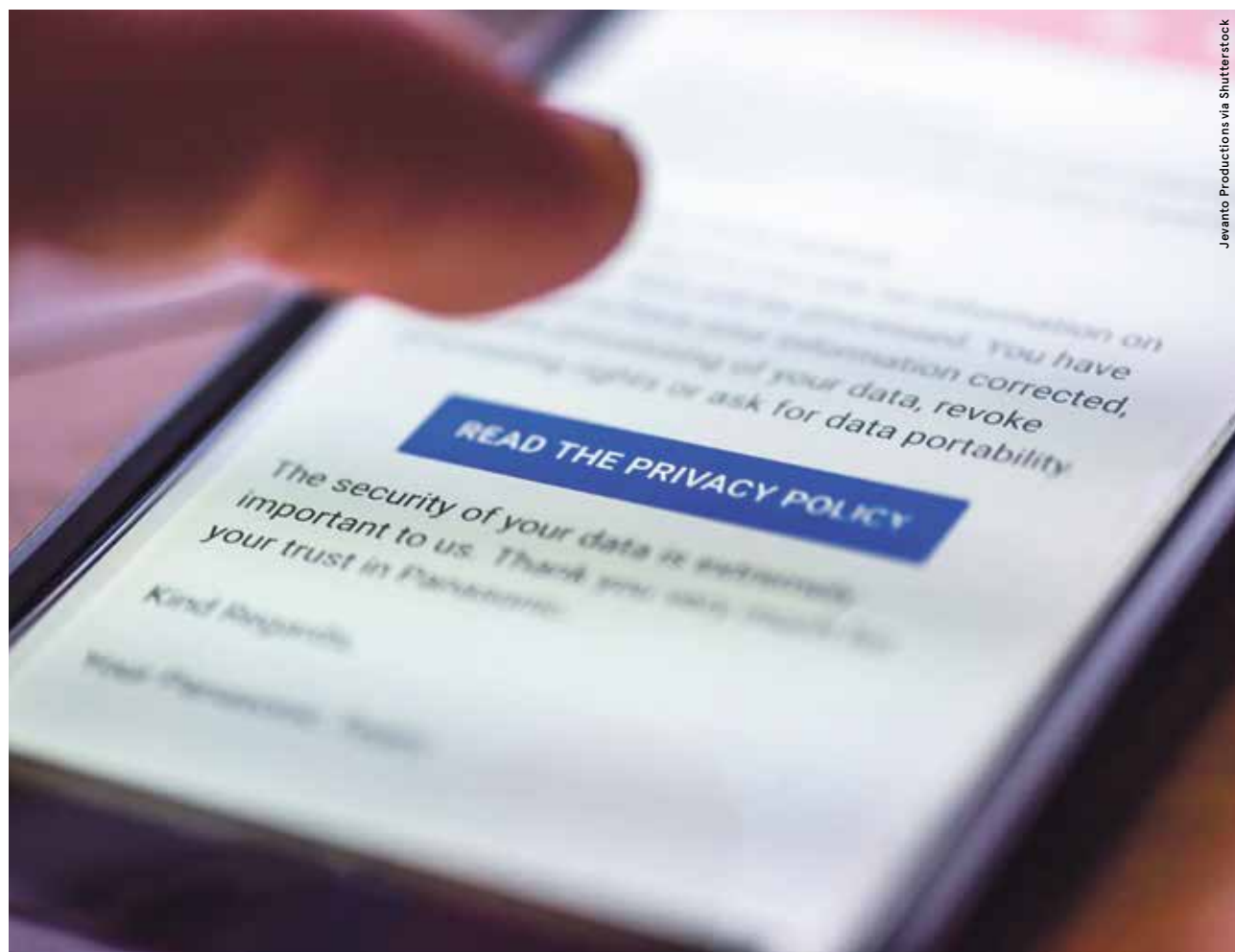
PRIVACY

A big data debate: online earnings versus public trust

Companies are collecting more and more data about their customers. Will this trend adversely affect their relationships?

Emma Woollacott

Sometimes it seems that companies know us better than we do ourselves, as they track our activities online and harvest all kinds of data. Customers are starting to take notice.

The biggest snoopers in this respect, according to cloud storage provider pCloud, are Google – by a long way – followed by Facebook, Adobe, Twitter, Microsoft and Snapchat. Meanwhile, websites are busily sharing data with third parties, it adds, highlighting the *Sun*, AOL and Pandora as particularly keen exponents.

It's a growing trend, according to a KPMG survey of US business leaders, which found that 70% of companies have increased the amount of personal data on consumers that they have collected over the past year.

In many cases, this is happening without a great deal of thought, according to Orson Lucas, a KPMG principal who specialises in data security.

"I work with some customers where the data they collect is not necessarily something for which they have a direct business outcome in mind," he says. "They may simply collect this material, be it cookies, geolocation data or addresses, as part of the relationship that they don't necessarily have a commercial need for."

In another recent survey of US consumers, KPMG found that 68% were concerned about the extent of data being collected by businesses, while 40% said that they didn't trust companies to use their data ethically. Moreover, with serious cyber attacks on large organisations hitting the headlines on an increasingly regular basis, nearly half of the respondents were worried that companies can't safeguard their data.

A similar survey by McKinsey found that 87% of internet users said they wouldn't do business with a company if they had concerns about its security practices, with 71%

saying they would avoid any firm that gave away sensitive data without permission.

Some companies cut the Gordian knot of trust by simply not collecting any data on their customers at all. For instance, digital commerce search and discovery platform Empathy.co uses a tool called MySearch to enable its clients' customers to register their preferences and interests on their own devices. The company simply reads the data, rather than storing the material itself. This means that, while that information can still be used to inform marketing activities, it can't be hacked or shared with third parties.

Empathy.co's founder and CEO, Angel Maldonado, says: "A consumer might go to one of our clients – for example, Music Magpie – because they're looking for an iPhone, say. The things they do on that site – where they click and what products they look at – are stored only on their device. Only when it's used do we read that data. We don't write it and we don't store it."

But not all companies can work this way. Some must store data because it's needed for their product or service to work properly. KPMG's research shows that consumers are more willing to share data when companies are open about how they will apply it and can offer specific use cases. That is something that Marshall Erwin, senior director of trust and security at Mozilla, says the company tries to do.

"Our approach when we collect data with our own products – and we do collect data

from the Firefox browser, for example – is that we want to be transparent with our users about exactly what we're doing. That means they know what material we're collecting and they know we're going to use it responsibly," he says.

Under the system that Mozilla uses, known as Stay Clean, certain cookies are required for the basic functioning of a site – log-in details or language preferences, for instance – but those used for marketing purposes are blocked.

"We collect only the data that we need for the product, which is a bit different from the practice you see across the industry, where many companies are vacuuming up everyone's data," Erwin says.

He points to "dark patterns" in the design of consent mechanisms: in essence, tricking users into approving the use of their data, either by making it far easier to opt in than to opt out, or by masking how their data will actually be used.

"We work very hard to avoid that in our own products," Erwin says. "The opposite of using dark patterns is being transparent – telling users in simple, clear terms what data is going to be collected and how it's going to be used."
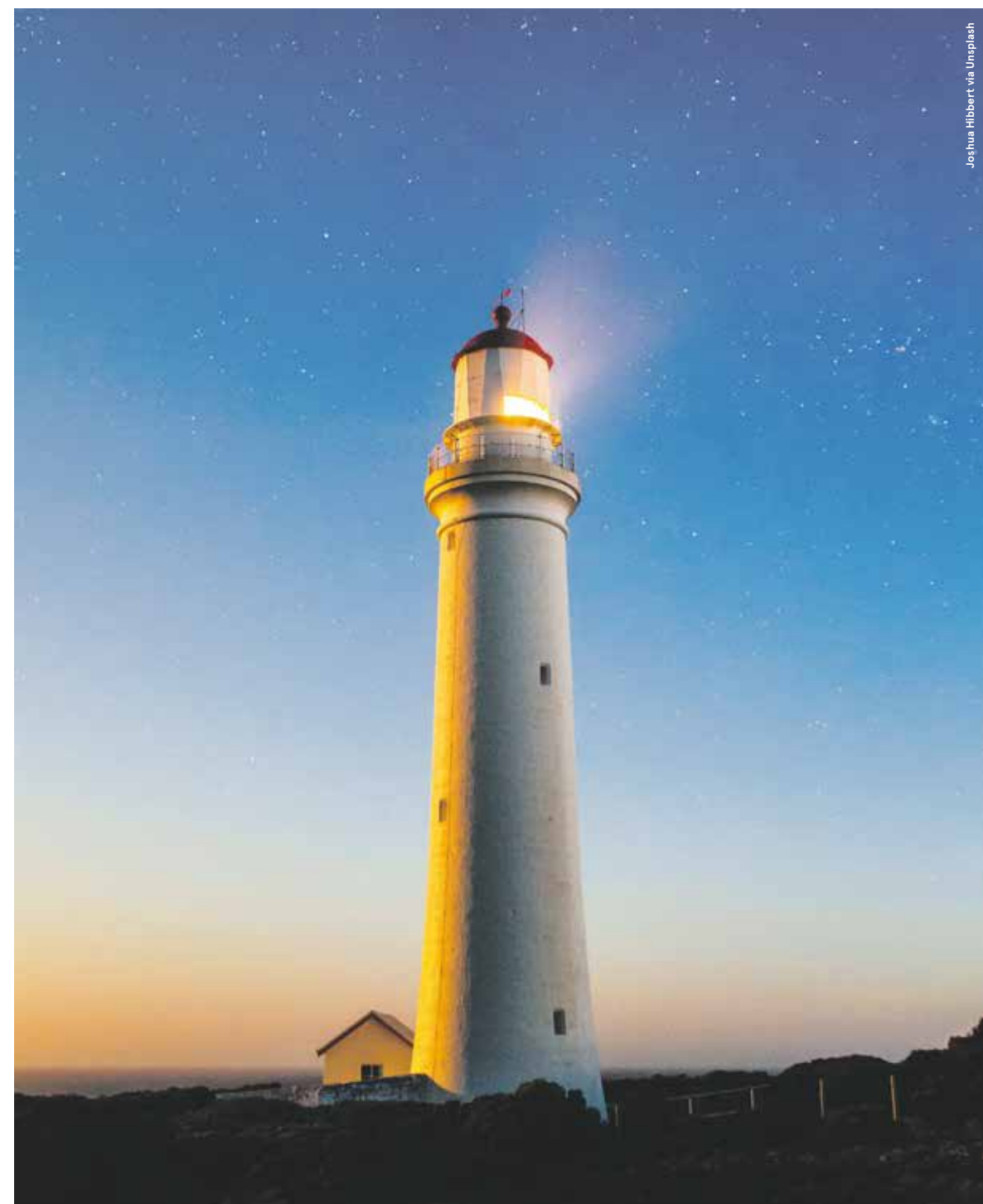
Increasingly, organisations are moving towards this more fine-grained consent approach: rather than asking for general consent, they are stating clearly which information is harvested and the circumstances in which it may be used. Not only can this approach improve compliance; it can also increase trust and actually help to build a better relationship with customers, because it gives them more of a feeling of control. For example, when consumers are told that health data from fitness apps may be used for medical research, half say they are willing for it to be used, according to the KPMG survey.

When consumers opt to share their data, it can indicate that they're interested in a deeper level of engagement with a business, creating an opportunity to establish more constructive relationships.

"When you think about it from the user's perspective, the reason that can help to build trust is that, as a consumer, you're basically telling the business: 'I am (or am not) comfortable with you keeping this data for these reasons,'" Lucas says. "Then, as a business, you can go deeper and say: 'Well, that's better. We can now understand you and what information you're comfortable with sharing.' It's all built on trust." ●

> **Our approach is that we want to be transparent with our users about exactly what we're doing. That means they know what data we're collecting – and they know that we're going to act responsibly**

OPINIONS ABOUT PRIVACY AMONG BUSINESS AND CONSUMERS

KPMG, 2021

Percentage of US business leaders who…

… report that their firm has increased the amount of personal data it has collected from consumers over the past year	**70%**
… acknowledge that their firm should do more to strengthen its existing data security measures	**62%**
… believe that consumers should be concerned about how their personal data is used by their firm	**33%**

Percentage of US consumers who…

… say they are becoming increasingly worried about data privacy	**86%**
… are concerned about the volume and nature of the data that businesses are collecting	**68%**
… don't trust businesses to use their personal data ethically	**40%**
… aren't willing to share their personal data for any reason	**30%**

Joshua Hibbert via Unsplash

Democratisation of data calls for a new philosophy

Data democratisation is the goal for a number of organisations, but there are many challenges standing in the way. Data lakes – but not as we know them – can provide an answer

With data increasingly viewed as the lifeblood of any modern organisation, the idea of democratising that data is taking hold among business leaders.

Put simply, data democratisation places the power of data into employees' hands, rather than keeping it hidden from view or restricted to a select few. When access to data is limited, its potential is greatly diminished. But democratisation can provide fast and valuable data-driven insights, often on the frontline, where it is needed most.

However, more than simply making more data available to more people, the concept often requires a rethink about how organisations manage, distribute and consume data. It can also involve widespread cultural change across the business.

According to Gartner, by 2023, data literacy will become an explicit and necessary driver of business value, demonstrated by its formal inclusion in over 80% of data and analytics strategies and change management programs*. However, there remain some roadblocks on the path to data literacy.

One is the obvious influx of data that organisations are facing. In 2020, 64.2 zettabytes of data was created or replicated. Moreover, the amount of digital data created over the next five years will be greater than twice the amount of data created since the advent of digital storage.

Accessing and analysing this data is central to an organisation's innovation and agility – both critical in the current disruptive landscape. But alongside the sheer volumes of data, many enterprises must contend with disparate pockets of data, siloed across the organisation in applications and systems.

At the same time, current technology limitations are preventing easy and cost-effective access to that data. In the era of big data, legacy systems had to be provisioned and configured, and the information entered into databases. This could take months and inhibits access to vital and time-sensitive data. And because of this cost and complexity associated with legacy technology, few organisations can afford true democratisation of information.

These are all gates that stand in the way of data democratisation, says Thomas Hazel, CTO & founder at ChaosSearch. "These gates – whether time, cost or complexity – are preventing companies from being data literate," says Hazel. "You can have hundreds of people in your organisation, and it takes weeks, months, and even years to stand up infrastructure to access the data. Data is the lifeblood of organisations, and when it takes weeks and months to get access to it, it's a problem.

"You need to have a different philosophy as to how data is consumed, stored, managed and accessed."

The ChaosSearch approach to moving, storing, organising and providing access to data quickly and efficiently is based on a data lake philosophy.

Hazel says the concept of a data lake is no longer bound by the time, complexity and cost restraints associated with some big data technologies from a few years ago. Cloud storage is the enabler of this lake philosophy.

Now, cloud object storage – as pioneered by Amazon Web Services (AWS) and serving as the foundation of all the cloud providers – is the simplest and most secure way to store data that can scale infinitely but cost effectively.

"A lake or cloud storage makes it so easy to stream data in. There's no complexity of standing anything up. There's no schema to structure it in a format, it can just be consumed. You just set it up and forget it," says Hazel.

> **Data is the lifeblood of organisations, and when it takes weeks and months to get access to it, it's a problem**

At the same time, he notes that many enterprises want a centralised way to identify what data they have and get access to it. The problem is, there aren't solutions that can take advantage of a lake philosophy.

ChaosSearch is a new way to represent information. Supporting multi-model data access methods, ChaosSearch makes data simultaneously available through Elastic, SQL and, in future, machine learning APIs. The ChaosSearch Data Lake Platform can connect to and index all data within a customer's own cloud storage environment – making it fully searchable and immediately available for analysis with existing data tools.

"We have built the technology to remove those gates to democratise that information because those old architectures, by definition, can't," explains Hazel.

"This combination of innovation with a new architecture and a new philosophy means what used to take months, or maybe years, to build out at petabyte

scale, now takes weeks or even maybe a day to stand up. That to me is a huge democratisation move."

It is also important to acknowledge that the difference between the old and new way of approaching data lakes is that now they can be activated for generating everyday business value.

"A lot of cloud storage platforms are archiving data for security or compliance. If their siloed databases fall down, they send it to the lake. We had to tell customers that they could activate it as their primary analytical source," says Hazel. "We tell our customers: 'Those use cases you're running for log analytics or for security, or you're using maybe Snowflake for business analysis, what if you had one platform with a lake philosophy that we activate to perform those use cases without changing a thing?'"

Additionally, because it plugs directly into enterprises' existing cloud object storage, they can have role-based access control for different departments and users, with access rights granted immediately. There is no need for a data engineer to wrangle the data, a team of engineers to format it, or a database administrator to define schema and relational tables and provide back controls.

"You could self-serve, and once you can self-serve the data is democratised," says Hazel. "You have to rethink how you manage information, as well as reinvent how to access the information."

By 2022, IDC says 90% of corporate strategies will explicitly mention information as a critical enterprise asset and analytics as an essential competency. Removing any gates to data literacy will be imperative to an organisation's agility and growth.

"If your business isn't adopting this new philosophy, you're in trouble," says Hazel. "If you can't access information, you're going to be left out. The time is now. You can start sending your data to your lake, without having to make a choice, it's just a philosophy choice."

For more information please visit chaossearch.io

CHAOSSEARCH

Ekaterina Nosenko via Getty Images

Red tape, innovation and the future of GDPR

Brexit could enable the UK to set its own course on data regulation, but can it achieve the right balance with privacy rights?

Jack Apollo George

Arguments about Brexit have largely focused on sovereignty, fishing, flags and a number on the side of a bus – nostalgic, deeply embedded markers of nationhood that kindle heated emotions and vicious debates. But some of Brexit's more direct implications could be felt in a far more modern arena: how companies digest and use our personal data.

Since 2018, this has been subject to the EU's General Data Protection Regulation (GDPR). Most internet users will have noticed on their first visit to a website a pop-up banner that asks them if they want to accept cookies. That's GDPR in action. The idea is that businesses need to justify what they do with people's personal data, so they must seek permission before they track our behaviour online and sell some version of our information to third parties.

But data is also the lifeblood of many emergent technologies, not least artificial intelligence. Some people believe that obliging businesses to jump through such hoops to collect marginal amounts of extra material might be a little unnecessary. Now that Westminster isn't so beholden to Brussels, it looks as though the UK might be moving away from some of that cookie-clicker jurisprudence.

In June, a group of Conservative MPs including Sir Iain Duncan Smith, Theresa Villiers and George Freeman showed their stripes as Tigrr. The Taskforce on Innovation, Growth and Regulatory Reform – an independent body, albeit one commissioned by the prime minister – roared into the debate by declaring that GDPR "overwhelms people with consent requests and complexity they cannot understand, while unnecessarily restricting the use of data for worthwhile purposes".

Freeman explains that Tigrr's proposed new regulatory framework would "better protect the rights of citizens and customers; create genuine liabilities to encourage big tech to take their wider responsibilities to society more seriously; and better facilitate digital innovation".

In August, it looked as though some of those mooted reforms would soon become a reality. Oliver Dowden, then the secretary of state for digital, culture, media and sport, told the *Telegraph* that the "data dividend" of Brexit would be "one of the big prizes of leaving". He promised a "light touch" approach that would prevent "box ticking" and allow the UK to harness the power of data as the new oil.

The next day, the Department for Culture, Media and Sport (DCMS) announced plans to pursue new data partnerships with advanced economies including the US, Australia, Singapore and South Korea. In doing so, it hopes to "unlock more trade and innovation by reducing unnecessary barriers and burdens on international data transfers, thereby opening up global markets to UK businesses". The benefits for consumers would be "faster, cheaper and more reliable products and services from around the world".

Freeman says that he would welcome such a bold move away from the EU's approach, which, he argues, ties the little guys up in GDPR red tape while leaving many consumers and small businesses vulnerable to real dangers on the web.

> ## "
> ### Our research tells us that most businesses think GDPR has been a change for the better. It has also found GDPR to be a huge benefit for consumers

But there are others who believe that the box-ticking approach encouraged by GDPR – imperfect, annoying and bureaucratic as it may be – serves an important role in protecting individuals' rights.

There's a reason for the UK's more liberal approach to data privacy, according to Adam Rose, commercial and data protection partner at law firm Mishcon de Reya. He explains: "Historically, almost all of mainland Europe was governed at some point by Nazis or Communists. If you were on the wrong list during those times, that in itself could get you killed. We've been very lucky in the UK that we haven't had that," he says.

Rose has spent almost three decades in the field. In recent years he has advised businesses seeking counsel on what they can or cannot do under GDPR, as well as individuals looking for clarity about, and control over, their own data. In his view, GDPR is like other EU laws in so far as it creates "signposts" instead of hard borders. To his understanding, it shouldn't cause too much difficulty for innovative businesses. "It just sets out a framework in which you can do what you want to do," he says.

Rose has developed his own framework for understanding data regulation. He suggests thinking about the different hats we wear during the week and at the weekend. When you're at work, it's useful to be able to "rapaciously gather in all this information about other people's spending patterns, eating habits and movements". But at the weekend, when you see a personalised advert based on something you didn't know you'd shared with the world, you're a "little more bothered by this. You're sitting at home, wondering: 'How did they know this about me?'"

By recognising that "you are the other person for that other part of the week, then GDPR probably gets the balance fairly right", Rose argues.

Indeed, even those who deal with GDPR on a regular basis admit that, by and large, the regulation makes sense.

"Our research tells us that most businesses think GDPR has been a change for the better," says John Mitchison, director of policy and compliance for the Data and Marketing Association (DMA), a trade body representing data-driven marketing companies and marketers in the UK. "The research has also found GDPR to be a huge benefit for consumers. It has inevitably increased trust in data-sharing."

But there is also a financial argument for deregulation. In theory, less red tape means more trade, while faster data flows imply more innovation. According to the DCMS, "estimates suggest there is as much as £11bn worth of trade that goes unrealised around the world owing to barriers associated with data transfers". It's a comparable figure to the £9bn that's been spent by large UK and US companies on preparing for, and complying with, GDPR.

Although Mitchison agrees with the DCMS's objectives and has heard many businesses say that they would benefit from a "more flexible interpretation of the regulation", he's wary that straying too far from GDPR's standards might cause more damage than it would fix.

"The government should not risk the EU's revocation of the UK's data adequacy status," he says, referring to the key agreement that allows data transfers to take place in the EU. After all, 75% of UK data movement occurs within the EU – a relationship that's worth more than £73bn.

As both Mitchison and Rose suggest, one of the biggest benefits of GDPR may have been neither political nor economic but educational. While cookie pop-ups are clumsy and could soon be technologically redundant, by making individuals take that consenting step, GDPR alerts us to the fact that we are regularly allowing portions of our personal data to be siphoned away. Since the Cambridge Analytica scandal of 2018 in particular, public concern about data privacy has been increasing. Around the world, legislators are taking inspiration from GDPR and moving towards more protections for their citizens, not fewer. Indeed, there aren't any obvious examples of data deregulation in the modern era.
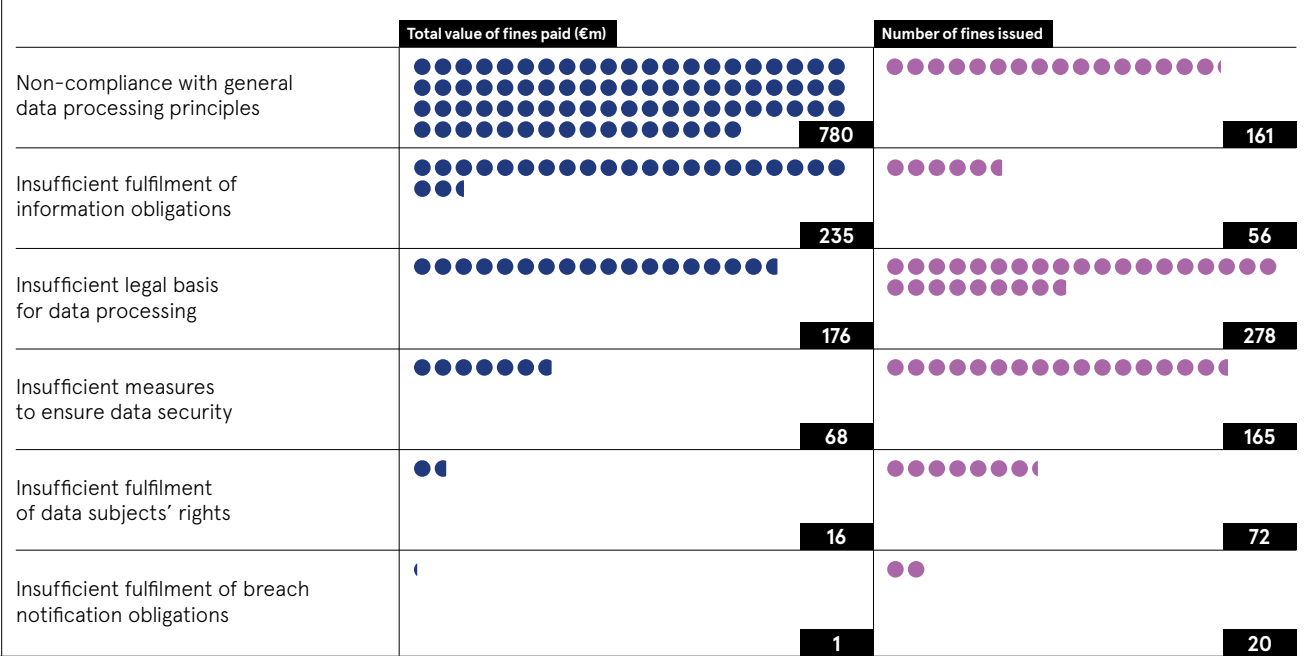
What's more, owing to the integrated nature of the global economy, the more stringent of the major jurisdictions tend to become the default for other law-makers and businesses. GDPR is widely accepted as the standard in data protection, Rose confirms. "Most countries look at it and say: 'We need something like that.'"

A week before the DCMS announcement in August, China published sweeping new data regulations of its own. Beijing pronounced that "no organisation or individual may infringe upon natural persons' personal information rights and interests" and that "excessive personal information collection is prohibited".

The reforms were interpreted both as a crackdown on the country's blossoming tech scene and a recognition of the potential national security threat presented by the mass collection of data.

We live in an age where ride-sharing, streaming and open-source systems have upended traditional conceptions of ownership and property. We interact with many things we don't own, so should we worry about owning those interactions? What's more, we regularly funnel information into big tech companies such as Google and Amazon, which have fallen foul of GDPR.

£11bn
worth of trade goes unrealised annually around the world as a result of barriers associated with the transfer of data

Department for Digital, Culture, Media and Sport, 2021

Indeed, almost any data that ends up in the US can be accessed by the country's security services – something that makes European privacy experts uncomfortable.

The EU has had similar concerns about the UK, but it has hitherto given its wantaway neighbour the benefit of the doubt on the data adequacy front.

Nonetheless, the complexities of digital life don't mean that we should give up on our rights to privacy. That's because, for thinkers such as Carissa Veliz, privacy is power. She's an Oxford professor of philosophy who focuses on the ethics of technology and artificial intelligence in particular. In her opinion, the latest announcements from the DCMS are bad news. Doing away with legislation that was enacted largely to protect the rights of citizens represents the thin end of the wedge.

"The less privacy we have, the less power we have and the more we're vulnerable to abuses of power by others – in particular, companies and governments," Veliz says.

Although she acknowledges the theoretical business case for the light-touch approach espoused by Tigrr and Dowden, Veliz is "worried that the UK might try to become what I call a data haven". Even if the EU were to continue granting the UK data adequacy status, the damage could be reputational instead of financial. In an extreme case, the UK could become an offshore centre for "data laundering" – a rogue state giving less scrupulous businesses carte blanche to turn data into cash.

As Veliz puts it: "Even if they did get away with it, they would be hugely damaging their image in front of the world."

Instead of seeing regulations such as GDPR as barriers to prosperity, we could conceive of red tape as a necessary first step that innovative companies must take before using personal information, she suggests. After all, we manage to think this way in other sectors.

Veliz explains: "Whatever it takes for a restaurant to keep the premises clean, then that's what it takes. Privacy and safety are minimum requirements. If it takes up to 30 days a year to keep my data safe, then that's what it takes."

But the politicians behind the reforms think there's an important distinction to make about proportionality and the scale of the businesses in question.
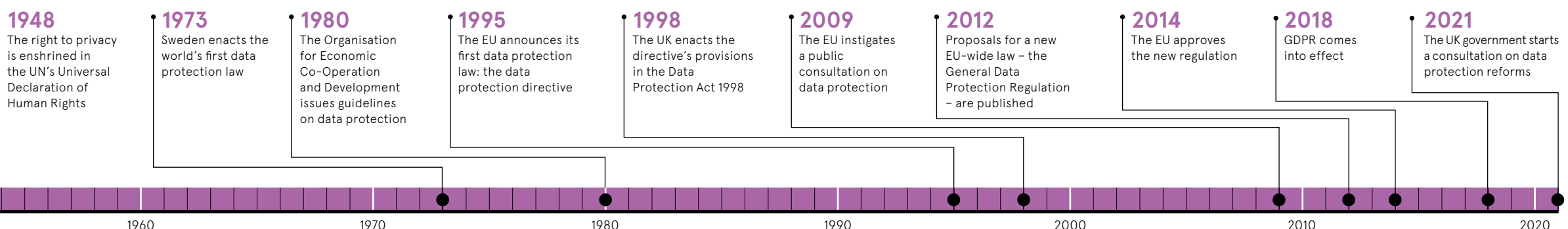
"We don't achieve catering hygiene by requiring all diners to sign away their consumer rights before they order a meal," counters Freeman. "All catering establishments have a legal duty to provide proportionate hygiene. What's expected from a village cricket club's tea is different from what's acceptable at Lord's, for instance."

Indeed, Dowden's suggestion that "we should not expect exactly the same from a small family-run business as we do from a massive social media company" hints at a more equitable approach to both privacy concerns and competition law.

Like all regulation that attempts to keep up with the pace of technological change, data protection laws will often be overtaken by innovations in the private sector. Every interviewee in this article agrees that GDPR has always been out of date in many respects. It was conceived before the likes of Google and Facebook became the giants they are today. At the same time, new privacy-enhancing technologies are already enabling many companies to go beyond the legal minimum.

Giving small British firms a better chance to compete with the big players could be a welcome boost for the UK's digital sector, but the government should be wary of the negative optics that deregulation could have for the Global Britain brand. ⦿

BUSINESSES HAVE BEEN FINED MILLIONS FOR VIOLATING GDPR

CMS, 2021

GDPR penalties by category since the regulation took effect in 2018

	Total value of fines paid (€m)	Number of fines issued
Non-compliance with general data processing principles	780	161
Insufficient fulfilment of information obligations	235	56
Insufficient legal basis for data processing	176	278
Insufficient measures to ensure data security	68	165
Insufficient fulfilment of data subjects' rights	16	72
Insufficient fulfilment of breach notification obligations	1	20

A brief history of data protection regulation

1950 1960 1970 1980 1990 2000 2010 2020

Commercial feature

THREE DATA CHALLENGES THAT CAN CAUSE AN INFORMATION GAP

1 Implementation
Data teams struggle to get pipelines and models from experimentation to production quickly

40%
of companies say it takes a month or more to deploy a machine learning model into production

Algorithmia, 2019

2 Synchronisation
Businesses need to take data beyond data teams and executive dashboards back out to operational systems and end users who need it

2025
the year IDC predicts that the most data-forward organisations will adopt 'headless analytics' by

IDC Futurescape, 2021

3 Data Culture
Modern analytics succeeds when data is democratised; legacy data tools were not built with democratisation in mind

Data teams need to enable data-savvy 'generation digital' workers to work with data in a controlled and curated environment and champion statistical best practices

DANGERS OF AN INFORMATION GAP

Flying blind
In an information gap, opinions rush in to fill the void. Organisations powered by opinion rather than valid data and information are doomed to failure.

Data without context
If raw data has no context, it can be bent to support the arguments of partisan perspectives under the guise of a formal analytics program. This environment produces some of the world's worst business blunders.

Untrained self-service
As data teams struggle to integrate and transform data with a lack of resources or modern tooling, impatient, digital-native workers simply download data directly from sources and try to stitch it together manually. This results not only in bad information, but also uncurated, uncleansed, inaccurate, and siloed datasets.
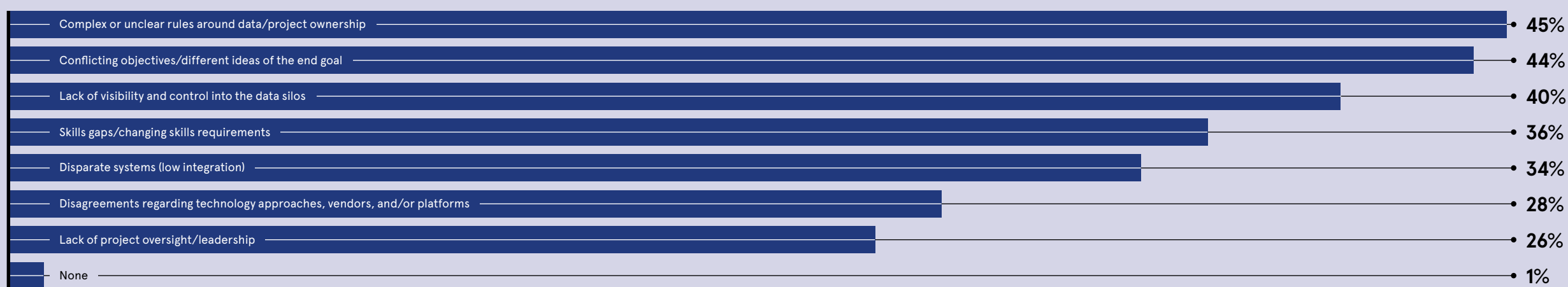
CLOSING YOUR INFORMATION GAPS

1 Align your data teams and empower them to work together with shared data and shared tools

2 Think beyond the dashboard and send enriched data back out into operational systems where end users can make more informed decisions on the front lines

3 Instill data best practices throughout the organisation with everyone from technical teams to executives to data end users

4 Create shared environments where everyone on your team can work from their preferred interface and toolsets while all using the same datasets

5 Accelerate implementation with a fast and secure infrastructure and automated governance

CHALLENGES WITH ENABLING COLLABORATION BETWEEN IT/DATA TEAMS AND BUSINESS USERS REGARDING DATA ANALYTICS PROJECTS

Survey respondents' top three challenges — Matillion, 2020

Challenge	%
Complex or unclear rules around data/project ownership	45%
Conflicting objectives/different ideas of the end goal	44%
Lack of visibility and control into the data silos	40%
Skills gaps/changing skills requirements	36%
Disparate systems (low integration)	34%
Disagreements regarding technology approaches, vendors, and/or platforms	28%
Lack of project oversight/leadership	26%
None	1%

Data analytics: bridging the information gap

What is the 'information gap' and how can enterprises overcome it to tap into the potential of their data?

The world's dependence on data has never been greater. Enterprises rely on analytics to take what are often huge volumes of raw data circulating through the business and transform it into rich, actionable information. However, with many organisations, this isn't the case.

"Imagine you want to make a tool or a car or a ship or a bridge out of steel, and you've got a huge pile of iron ore. You need to refine the ore into iron or steel before you can make something out of it. That metaphor is incredibly accurate for the world of data," says Matthew Scullion, founder and CEO of Matillion, a cloud data integration and transformation platform.

"We have a gigantic pile of data that's getting bigger and bigger at logarithmic speed, but you can't make anything out of it and turn it into analytics-ready data. There's this huge mountain of possibility that you can't tap into until you've refined it."

Data, data everywhere...
So what is causing this information gap? Why is there such a disconnect between owning valuable data and turning it into something useful and usable?

There are several reasons. Data may be dispersed across the organisation in silos, out of sight – and mind – of business decision-makers.

There are also technical barriers to companies failing in their efforts to achieve data-driven decision-making. Datasets that live in legacy technologies that can't keep up with the demand for rapid insights and the diversity, wide distribution, and dynamic nature of modern data. The result: analytics that yield inaccurate and incomplete information, or information that is siloed from the users who need it.

For example, any high street bank will have a computer system where accounts are stored. They will know customer information such as balance, withdrawals and deposits, and any charges. They will also have a customer relationship management system

Like those iron workers before the Industrial Revolution, the quality of the output was questionable, the production rate was low and, importantly, only a few people had the skills to do the work. This, says Scullion, is where we find ourselves with data today. This scarcity of skills and processes has created the information gap within organisations.

This information gap is particularly prevalent in large enterprises. The larger the business, the bigger the pile of data that's valuable but not yet useful. Additionally, there's more technological complexity across the enterprise, and if you're a bank or a manufacturer or a huge retailer, only a tiny fraction of the people who work for you will be data analytics experts. This means the problem is more pronounced - and the stakes much higher - in the world's biggest organisations.

with the customer's contact details, marketing preferences and anything else they've learned through their interactions. Perhaps there is another system that tracks how and when a customer requested help from a service desk, or how many times and in what ways they've used online banking or mobile banking. And then finally, there will be information from credit reference agencies about credit histories.

"The problem is that if a bank wants to create a machine learning algorithm to tell them if it's a good idea to extend credit to a customer, or whether they will appreciate you offering them a certain product, then they need many of those parts of the story in one place," says Scullion.

The process of making data useful relies on joining it together and organising it so it's neat and tidy, and aggregated to the right level to make it useful for analytics. But in reality, there can be hundreds or thousands of steps to go from raw material to analytics-ready data. And of course, these steps need to be done carefully. They need to be secure, to make sure the right data doesn't get into the wrong hands. And things like permission rules and geographical regulations must be carefully followed.

"On a very small scale, it's possible to do that without much extra technology to help – you could just write some code and you've got the analytics-ready data," explains Scullion. "But when you scale that up to a large company, then doing it in that manual way isn't quick, scalable, secure or maintainable enough.

"We can use data to make the world a much better place. But if the pipe supplying

us is too small, then the rate at which we can do that is materially reduced. What the world needs and wants is technology that widens that pipe and allows organisations to turn raw data into useful data more quickly."

Bridging the information gap
What, then, is the answer? "The world needs a technology platform, a highway of data, where all these different bits of raw material can come together and be refined into

analytics-ready, trusted, useful, clean data that can then be put to work," says Scullion.

"We need a technology layer to solve that problem, and that's what Matillion has built – a data operating system on which enterprises can at scale make that data useful. And in doing so, they can bridge that information gap, fix that constraint in the supply chain of data and make the world a better place by pointing to this new commodity that is data."

There are now more than 1,000 enterprises around the world using Matillion to bridge their information gap. After launching the platform in late 2015, Matillion has become one of the fastest growing and most valuable late-stage startups in both the UK and Western Europe, driving exciting levels of growth.

Matillion makes use of the limitless, cost-effective power of the cloud. "The cloud has unlocked this generational shift in the use of data," says Scullion. "Before the cloud, we couldn't afford, and therefore we didn't have, the ambition to capture the data and to put it to work. But the cloud provides this incredibly cost effective, powerful and easy-to-make- use of technology to capture and store data, and then put it to work.

"That's the backdrop against which the world is pivoting to data and against which data is becoming the new currency."

Additionally, Scullion says Matillion can be stood up in minutes, and can be learned in a few hours or days. The time to value is a few days or weeks. "That's because it's simple to launch, manage and use, but not at the expense of capability," he says.

"With a technology like ours, which is visual, we call it 'low code, no code, code optional'. So you can make data useful without needing to write code. That makes it much easier, and more intuitive to use. It also makes it much faster and more productive, but still powerful."

Matillion is secure, scalable and performant, and can coexist with the enterprise's rules, policies and procedures, and other technologies. Additionally, the technology can be used by a much broader spectrum of business users, putting the value of the data into the hands of more users.

Q&A

Modern analytics and the business of misinformation

Ciaran Dynes, chief product officer at Matillion on how businesses can make better use of data analytics and the skills they will need to do so

> **Modern analytics is much more about predictiveness; there's no absolute certainty. Companies must ask questions to build an answer**

What are some of the challenges facing modern organisations when it comes to data analytics?
A lot of industries evolved with executives that were never required to work with each other; that created artificial barriers. But if everybody is genuinely putting the customer at the heart of their business, there will be no problem with sharing the data. They need to figure out 'what would a

better customer experience be for us?' And then work out 'what questions do we want to ask?' Then it should be the case that the team is required to work together.

That is what happened largely in the big data era. People have realised it's better to share internal data, and then to pick their battles - the one or two things that they could do to basically improve customer experience, reduce risk, cut costs. It's possible today

because the technology is available to do those things.

What is the difference between traditional and modern data analytics?
With traditional analytics you might add up a bunch of numbers to get an answer to a question such as, 'who are our top 10 customers?' But with modern

analytics, there's not necessarily one answer. There might be a scale of answers, with a minimum and a maximum, and somewhere between lies the answer.

Modern analytics is much more about predictiveness; there's no absolute certainty. Companies must ask questions to build an answer. Sometimes the answer will be definitive and sometimes the data comes back and it's inconclusive. The skill of the business

is challenging the answer that is returned, saying 'I think there's not enough evidence to suggest that's the answer.'

What about 'fake news' in the context of business data?
You can't escape the misinformation in society. There's actually been no rise in misinformation, it's just digitised nowadays so it gets into the public domain instantly. Organisations also have misinformation in their business. But misinformation is not always inaccurate information, it is interpretation, it's context, it's bias. That's the real challenge for businesses going forward – they need more and more and more of this different data that we can put together to either prove or disprove that argument to be true or false.

How do we get information? How do we look at misinformation? How do we come up with a question or a hypothesis that may or

may not lead to an answer? Modern business is based on those things.

What's an example of modern analytics?
There are brilliant things that we do in the world with data; there are some amazing stories in government, in healthcare and in insurance. I'm immensely surprised all the time by these interesting stories.

For example, an insurance customer in Washington in the US is looking at the data of forest fires. They provide car, house and property insurance, and with forest fires so prevalent they have an enormous impact on their business. They are pulling data from things like geothermal sensors in the ground and using weather pattern information to perform projections and analysis based on temperature change.

They have no choice but to have an opinion on things like the environment and climate change. That is the business of insurance – hedging bets against a set of outcomes, and some of those outcomes are profound for society.

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How decision intelligence could democratise data analytics

It's never been easy to make the most of big data, machine learning models and analytics, but decision intelligence could change all that

Tamlin Magee

Decisions, decisions, decisions. We make them every day: bad ones, good ones, seemingly inconsequential ones that have profound implications. It's no wonder that 'analysis paralysis' plagues so many of us, even if the stakes are as low as choosing which brand of ketchup to put in our shopping trolley at the supermarket.
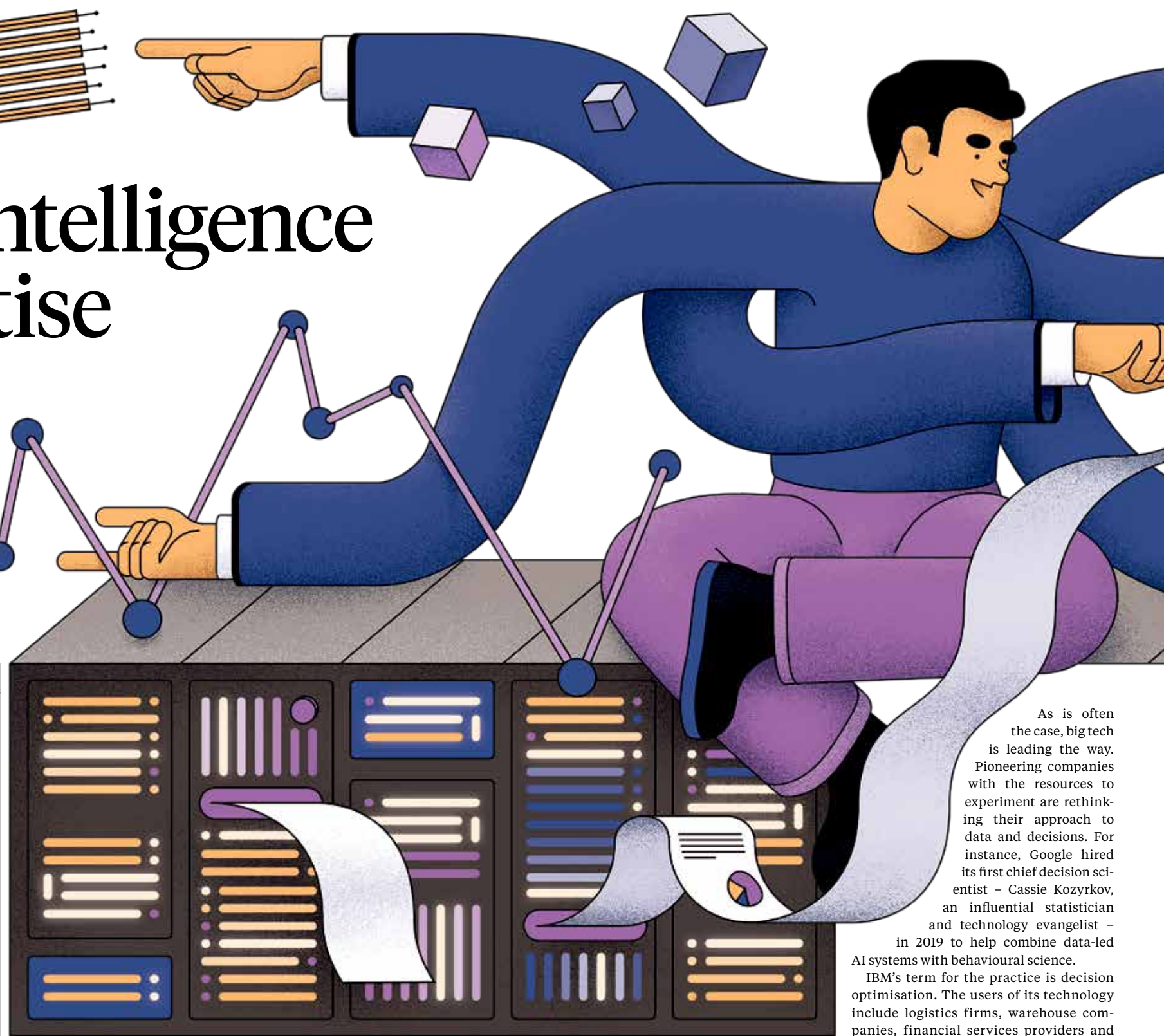
When the stakes are higher – running a multibillion-dollar company, say – businesses need to strategise. Many years ago,

Companies will be nimbler with their strategies, which should drive better performance and better results. Corrective action will be more focused when we understand the 'why' and is likely to be more successful

data collection meant hiring consultants, conducting thorough A/B testing and in-depth market analyses. More recently, the explosion of big data and smarter software has allowed for business intelligence (BI): really deep, detailed analytics systems, helping organisations to determine out the most appropriate course of action based on the information they hold about the past and present.

While BI has proved enormously valuable to organisations of all stripes, a new practice is emerging: decision intelligence. Put simply, this is the commercial application of artificial intelligence (AI) to make better business decisions. It aims to take data-led insights a step further. It's been called the new business intelligence, but really it means broadening the capabilities established by BI in a much more intuitive, smarter way.

Having all the data in the world is useless if it doesn't teach you anything. Just look at the National Security Agency, which busied itself by diligently collecting every detail it could on US citizens, to the extent that it rendered its surveillance systems ineffective, according to whistleblower William Binney. Useful material needs to be separated from the junk, and businesses need to draw insights from it.

Decision intelligence could provide a solution. Merging data science with social science, this technology promises to democratise analytics, applying machine learning to data and helping its users to make the right calls. The social science aspect is crucial. While machines are getting much better at doing the heavy lifting for laborious manual tasks, they still lack the nuance and understanding that humans possess.

A decision intelligence initiative might mean examining large sets of data, running potential outcomes through machine learning models and presenting decision-makers with potential courses of action to take. This isn't mere buzz from vendors. Gartner believes that a third of all large organisations will employ analysts who practice decision intelligence, including decision modelling, as soon as 2023. That's partly because it's becoming far more complex to make decisions. A recent Gartner survey found that nearly two-thirds (65%) of companies believed that the choices they were making were more complex than they were two years previously, while 53% said there was more pressure on them to justify all their calls.

As is often the case, big tech is leading the way. Pioneering companies with the resources to experiment are rethinking their approach to data and decisions. For instance, Google hired its first chief decision scientist – Cassie Kozyrkov, an influential statistician and technology evangelist – in 2019 to help combine data-led AI systems with behavioural science.

IBM's term for the practice is decision optimisation. The users of its technology include logistics firms, warehouse companies, financial services providers and energy suppliers.
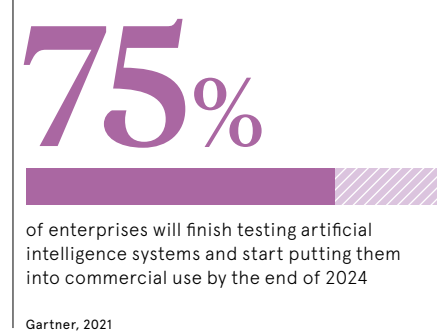
Lesser-known players in this market include Manchester-based company Peak, which recently drew $75m in series C funding from the SoftBank Vision Fund; and Quantellia, co-founded by machine learning pioneer Dr Lorien Pratt, who has written a book on decision intelligence. It counts big companies such as SAP, Cisco Systems and RBS among its customers.

Use cases for decision intelligence to date have typically been found in pharmaceuticals, transport, finance, utilities and others where supply chain optimisation is crucial for maintaining competitiveness.

75%

of enterprises will finish testing artificial intelligence systems and start putting them into commercial use by the end of 2024

Gartner, 2021

Why data is the key to better decisions

Companies that recognise the need to make data more easily accessible across their enterprise are reaping the rewards

From the retail giant Tesco to the global transport hub at Gatwick Airport, business leaders are recognising the need to base their decision-making on highly visual and easily accessible data.
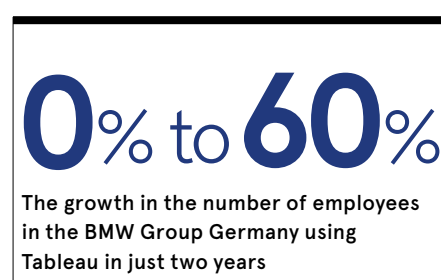
Tesco used to employ two full-time staff members dedicated exclusively to producing Excel reports on its learning and development activity. Now, nearly all reporting is automated on the analytics platform Tableau, saving thousands of hours annually.

"People see how easy Tableau makes it to understand complex data sets and they soon want to know how they can apply it to their own business areas," says Derek Mitchell, insight and analytics manager at Tesco's Customer Engagement Centre in the UK. Without Tableau, important insights would still be going undiscovered, buried in spreadsheets and forms spread across the business, he says.

Since Tableau was implemented at Gatwick Airport, it has given employees access to fast, intuitive analytics through a centrally governed platform, says Shariq Wagener, director of data and analytics for Gatwick Airport's implementation partner Zsah.

"Decision makers at every level, from senior executives to airport operatives, now have direct access to the information they need to make fast, informed decisions," says Wagener. "Everyone is more engaged with data. They're using it to speak with each other, learn from each other and help each other as well. If that isn't a strong data culture, I don't know what is".

It is the speed and agility of the more data-oriented organisations that sets them apart, says Dan Pell, Tableau's senior vice-president, EMEA. "Tableau has an innate ability to spark quality conversations that lead to transformational outcomes

0% to 60%

The growth in the number of employees in the BMW Group Germany using Tableau in just two years

€4 million

The annual energy and cost savings at Henkel, largely due to having improved data visibility and transparency

for business. Conversations are fluid, and dashboards are fixed, which gets people and processes working together more effectively," he says.

"We partner with our customers on their strategies, helping them empower their people to explore data, ask questions and find insights that matter, so the right decisions are made at the right time. These quality conversations are good for business – they can make you faster, more innovative, more sustainable and bring together more diverse thought".

Like so many multinational organisations today, effective data reporting and analytics are critical to Henkel, the Germany-based consumer goods giant. The company uses Tableau as part of its innovative digital supply chain.

"In 2019 alone, we identified energy and cost savings worth €4m, much of which is the direct result of better data visibility

and transparency. We've also been able to reduce energy consumption across our Laundry & Home Care global supply chain by 20%," says Dr Johannes Holtbruegge, senior manager of digital transformation at Henkel Laundry & Home Care.

Henkel started building data skills across its business with Tableau in 2016. In just six months, the Henkel 'Tableau community' grew from only a handful of central analysts to more than 2,100 Henkel users, ranging from global managers to factory line operators.
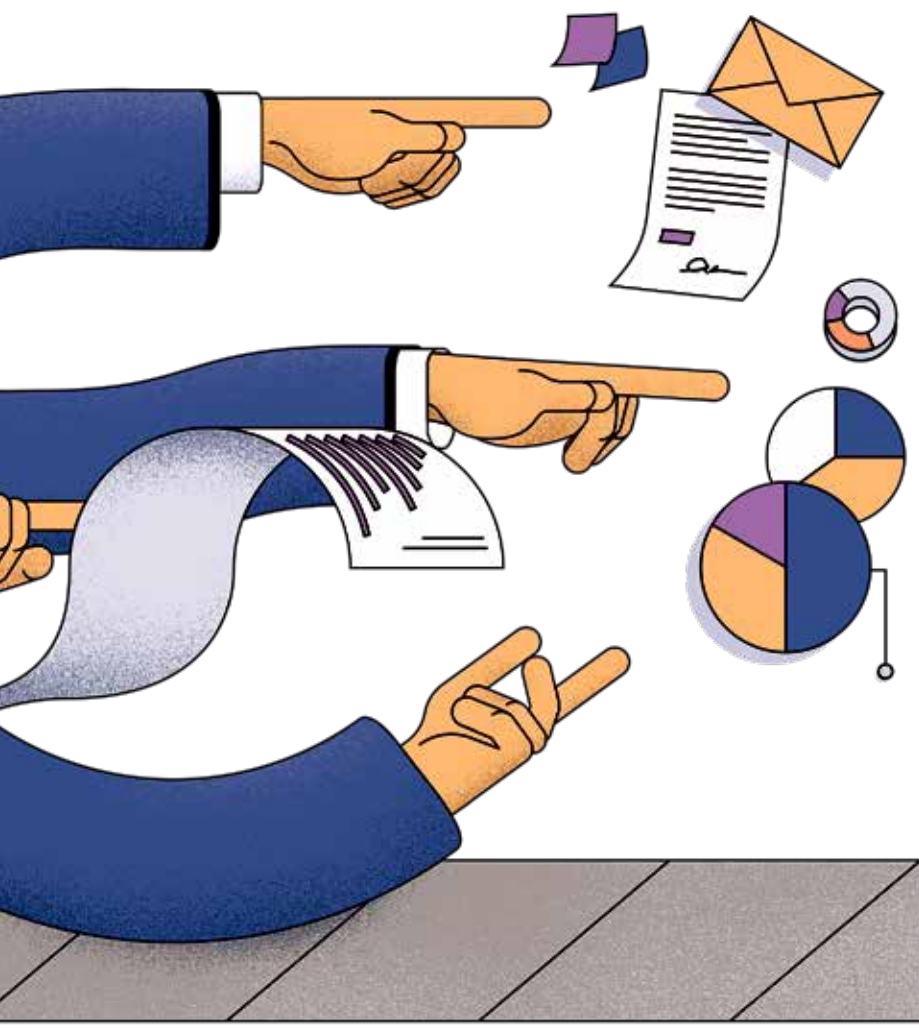
Dr Holtbruegge explains why their culture of empowering everyone to use data has made all the difference in the new work-from-anywhere world: "All of our major KPIs are online and managers can easily access them from home. We have also created a sales and operations planning dashboard that managers can access remotely and use to support this critical alignment between disciplines on a local, regional and global level."

The availability of data analytics brings new superpowers to all team members, from executive leadership to frontline workers who deal directly with customers. "Tableau enables people without a data background to pick it up very quickly," says Saagar Weth, data analytics team leader at BMW Group Germany.

"Questions can be asked and answered on the spot during meetings, instead of taken away to be answered later. It completely changes the dynamic of these meetings, where conversation focuses on why something is happening, not what."

25% → 35%

The percentage of larger organisations buying or selling data via formal online marketplaces in 2020 and 2022 respectively

Gartner, 2021

> **The decision intelligence platform we used was instrumental in our ability to get the work done efficiently**

Traditional BI relies on static data, meaning that organisations are looking in the rear-view mirror, according to Claire Rutkowski, CIO at software firm Bentley Systems. While this provides a wealth of information that can be used as the basis for better decisions, users have to know what data to look for and how to interpret it, she explains.

"They need to work with a data office or similar function to figure out how to extract the data, manipulate it, create filters and then validate the results before the report is published."

Decision intelligence is "much more powerful", Rutkowski adds, because it allows for natural-language queries and can answer deeper questions, offering insights on the 'why', not just the 'what'.

At present, the framework for decision intelligence is loosely defined. Krishna Roy, senior research analyst for data science and analytics at 451 Research, says that decision intelligence uses automation and machine learning, which isn't usually the case with plain old BI.

This seemingly small difference has significant implications that are already proving a powerful tool for some businesses. For instance, beverage multinational Molson Coors saw the opportunity to gain better insights into its vast, complex operations, continually improving how these were managed at a speed and scale that only AI could make possible.
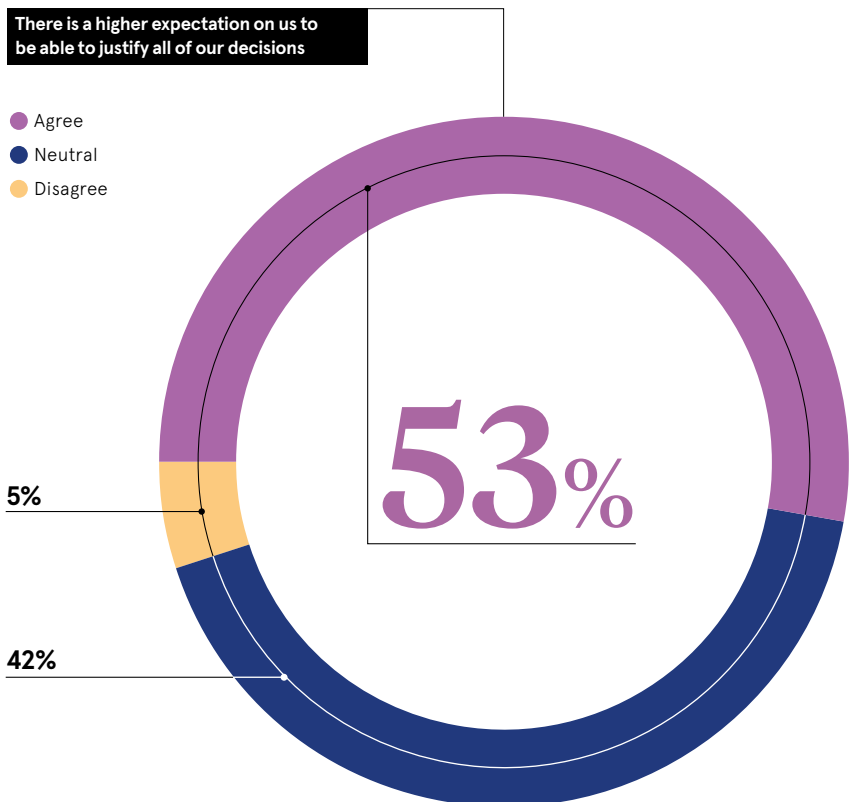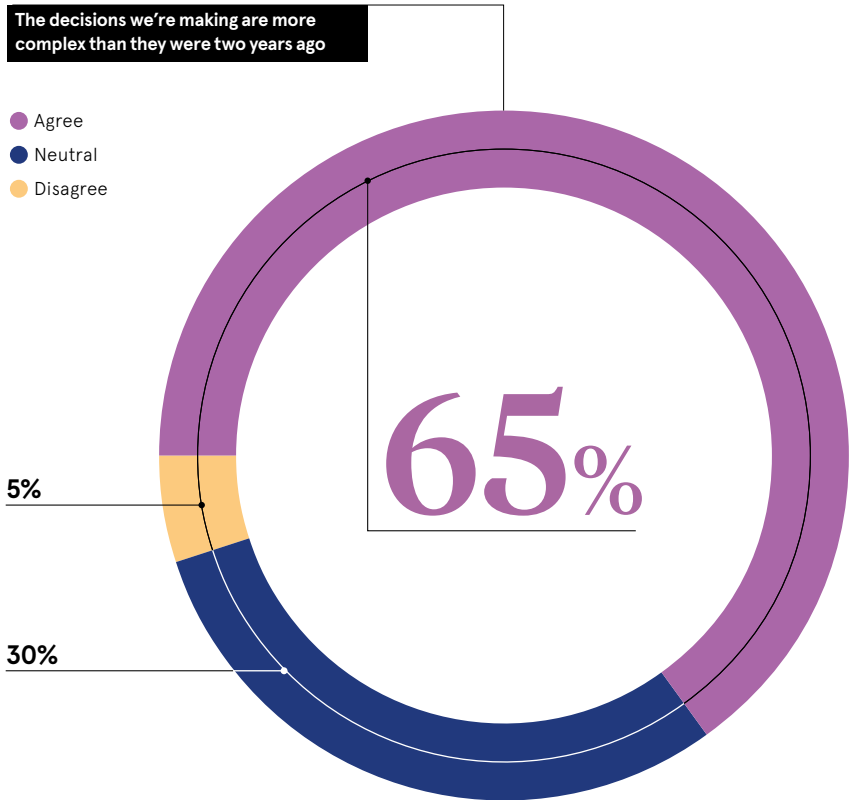
In mid-2020 the company approached Peak. Together, they set about assessing potential areas of its operations where the platform could be deployed, speaking with key people in the business to ascertain how their roles could be improved. By Christmas, they'd agreed on a trial, with work starting in February 2021 and rolling out nationally in July.

Mark Elston, digital solutions controller at Molson Coors, explains that the company has a huge technical services team operating in the UK. Decision intelligence helps its members to capture insights and translate these quickly into service improvements.

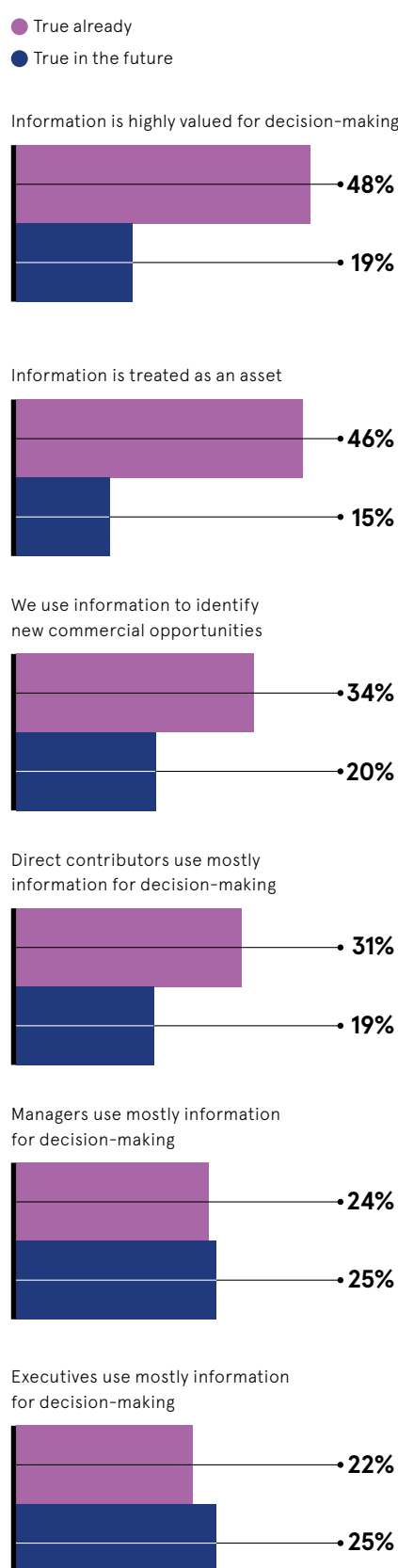One of the brewer's big commercial projects this year has been the rebranding of one of its lagers, Coors Light, to Coors, Elston says. This multimillion-pound investment included the replacement of 20,000 "dispense points" with newly branded versions. This was a "massive operation where a decision intelligence solution really came into its own".

The system takes information from engineers' schedules, such as their planned jobs, the most likely routes they would take to reach a given site, their skill specialisms and the equipment they have in their vehicles. Then it calculates where they may be able to perform additional rebranding work without causing significant disruption.

"Because this is all being done by a computer, it happens live, making the whole process incredibly dynamic and responsive," Elston says. "The platform was instrumental in our ability to get the work done efficiently and at pace, enabling our customers to get back up and running with newly branded dispense points faster, with minimal disruption."

Such cases are becoming increasingly common, with decision intelligence making a difference to businesses right now.

Rutkowski predicts that the increasing adoption of the technology is likely to improve both the pace and quality of corporate decision-making. It will enable firms to accelerate the entire process, quickly glean insights and develop plans to either act as countermeasures to their discoveries or make better use of any opportunities that are revealed. She adds that Bentley Systems is layering decision intelligence tools into its data technology stack to draw more insights from its data.

"Companies will be nimbler with their strategies, which should drive better performance and better results. Corrective action will be more focused when we understand the 'why' and is likely to be more successful," Rutkowski says.

And, for those businesses struggling to recruit professionals to interpret the data they generate and draw insights from it, decision intelligence could provide some mitigation for the UK's data skills gap, which the government has acknowledged is a problem.

Decision intelligence "promises to bring analytics to the masses", Roy explains. "It's all about providing insights to answer questions without requiring the user to have smarts in analytics." ●

Are you ready for the adaptive future?

Businesses that want to drive data and digital transformation need to adapt to put the customer at the heart of the business and build deeper relationships

Today's consumers have high expectations of the companies they buy from. We assume that companies will remember us, know our preferences, and offer us personalised promotions and services on any device in any location.

For many years, it was assumed this kind of customer-centric service was too expensive and complex for any business beyond Silicon Valley startups. But this is no longer the case. Any organisation that wants to be successful needs to be able to recognise customers at scale and offer an appropriate, personal service. Now, the barriers to do that have been removed.

At Merkle, we help automotive brands reach their customers by connecting their view of the customer across digital, physical and human interactions. We drive better customer outcomes at some of the UK's largest financial service brands by transforming to digital excellence.

Our telco and media clients increase customer satisfaction through a holistic view of their interactions – from device to call centre. And in travel, hospitality and retail, new ways of serving customers are made possible through in-venue front-end platforms underpinned by an adaptive understanding of customer needs.

The customer identity

Creating this type of customer-centric experience relies on companies having a single customer identity that spans channels, products and other operational silos. We have learned that in most cases, these programmes need to be underpinned by a full-scale data transformation.

Today's data strategy needs to move away from building slow, monolithic databases. Our focus should be on being adaptive – building data capabilities that have flexibility in the design process and are prioritised by customer value. We call this process customer experience management (CXM).

CXM is a strategy that spans marketing and IT and involves combining data transformation and digital transformation. This isn't a one-time operation – being adaptive means being ready for constant change and this involves quite a significant organisational shift.

An adaptive identity strategy should put the customer at the heart of the business and decision-making, including changing what is measured as success. There must be a focus on collecting and acquiring data that builds deeper relationships with customers, not just increasing the amount of data.

Adaptive identity strategy checklist

- The CMO needs to own the customer strategy and have a clear understanding of what they need to do to improve the customer experience, but the CTO & CIO must have bought into it for the execution to work

- The strategy needs to include the entire customer experience, from websites and in-store experiences to call centres

- Businesses must plan for a rapidly changing future and understand the innovations that will bring more connectivity to their brand experience

- The customer identity should be hosted in the cloud for maximum speed and flexibility

- A fair value exchange must be created so that the information customers provide is in proportion to the benefits they receive

- Keep control of data for regulation and ensure that a senior executive is responsible for data compliance

Case study – Tivoli Gardens

Tivoli Gardens in Copenhagen is the biggest tourist attraction in Denmark, with restaurants, rides, music and other leisure activities that attract a broad range of customers.

"Until recently our company's IT landscape was fragmented, resulting in a disconnected experience for customers. To create an enchanting digital experience, Tivoli and Merkle developed an omni-channel presence for including web, commerce, apps and a loyalty programme" says Michala Svane, senior vice-president, sales and marketing, at Tivoli Gardens.

"This created a CX-driven ecosystem that allowed Tivoli Gardens to pivot our entry ticket and annual card-based business to a subscription model with a monthly or yearly renewal, called Magic on Demand."

Tivoli has grown revenue from local customers using behaviour data and propensity models, making it a more year-round business and less vulnerable to fluctuations in weather and tourism patterns. In the last full year before Covid-19, local guest numbers were up by 10% and annual card revenue increased 20%, while 40% of card holders moved to one of the new subscription models within the first year.

Three years after launching the subscription-based model, 57% of all annual passes are on subscription.

Interested in finding out how adaptive identity strategy can help fuel your organisation's customer experience management strategy? Then visit merkleinc.com/emea or follow the QR code

MERKLE

Alternative data: the fuel powering data-driven business decisions

Or Lenchner, CEO of Bright Data, discusses the rise of alternative data and its impact on sustainability goals

Data has never been more freely available or more abundant. In fact, according to research by IBM, an astounding 90% of all web data was generated in the preceding two years. The truth is that data is not the 'new oil' as is often claimed. Instead, it's more like water. This is due to its sheer volume and because its availability is fast becoming crucial to the survival of businesses and organisations worldwide.

Data-driven decision-making has long been an established practise in successful organisations. However, thanks to this public web data explosion, many are reducing their reliance on traditional data sources like market forecasts or earnings reports. Instead, they're accessing up-to-the-minute alternative data from the world's largest database – the internet.

Sectors including ecommerce and travel have been relying on web data for several years. Meanwhile others, such as financial services, are just now harnessing the power of web data, and tapping into it as part of their day-to-day activities. Why? For the simple reason that accessing public data enables fast, accurate decision-making – a necessity for many businesses navigating the rapid market shifts that have become our reality.

What is alternative data?

In the context of financial services, alternative data – also known as alt-data – refers to information that doesn't come from traditional sources (for example Companies House, broker forecasts or financial records). This is extremely broad in scope and can include social media posts (used to measure consumer sentiment), satellite imagery (to detect footfall), weather reports (to predict the likelihood of extreme weather events), and so on.

A huge quantity of alt-data is publicly available across the internet and can be retrieved using forward-thinking data-driven technology and tools. Financiers are increasingly relying upon these to support their decision-making and strategic planning.

To make the most of web-based alt-data, consistency is key. For instance, a bank looking to invest in a particular business won't be able to accurately gauge its public image from just 24 hours of social media data – a longer-term approach is needed. Plus, with enormous amounts of data being generated online, it's crucial to set up exacting parameters for data collection to avoid getting lost in the noise.

Alternative data as an ESG enabler

One growing use of alt-data is in the financial services sector, where it is increasingly used to evaluate the environmental, social, and corporate governance (ESG) credentials of businesses. In fact, the majority (88%) of financial services data leaders who participated in a 2021 survey said that their organisation viewed measuring and reporting on ESG performance as either a 'key metric' or 'of moderate importance'.

Today's financiers have realised that channelling investment into businesses that contribute towards positive change in the world is not only morally good but can help to ensure the long-term performance of their investments. Doing so can also mitigate risk, boost their institutional reputation and attract new clients. In short, ESG is a money maker.

There are many ESG ratings providers out there. Most use their own unique formula to calculate a single ESG score. These one-and-done scores can be a helpful starting point, but they don't give investors a comprehensive view into the ESG risks of investing in a particular organisation. To take just one example, some standardised ESG rankings place tobacco companies above large tech or financial services businesses. This is a one-sided assessment, to say the least.

As such, many banks and financial institutions are building proprietary ESG analysis and reporting systems, powered by web data tools. These enable financiers to determine which ESG factors they consider most important, and how they are weighted.

Looking forward, as the speed with which data is generated intensifies, so too will businesses' dependence on it – not just in financial services but across all sectors. As more businesses seek to access web data, this exciting new information source will no doubt continue to shape how the world does business through the next decade.

For more information please visit brightdata.com

brightdata

24%

of financial services professionals who work for organisations that collect alternative data use it to aid their work every day

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DECISION-MAKING IN BUSINESSES IS BECOMING MORE COMPLEX AND MORE IMPORTANT

Percentage of companies that agree or disagree with the following

The decisions we're making are more complex than they were two years ago

- ● Agree
- ● Neutral
- ● Disagree

65%

5%
30%

There is a higher expectation on us to be able to justify all of our decisions

- ● Agree
- ● Neutral
- ● Disagree

53%

5%
42%

Gartner, 2021

BUSINESSES ARE STILL WORKING ON HOW TO IMPROVE DATA-DRIVEN DECISION-MAKING

Percentage of companies that say the following

- ● True already
- ● True in the future

Information is highly valued for decision-making
- 48%
- 19%

Information is treated as an asset
- 46%
- 15%

We use information to identify new commercial opportunities
- 34%
- 20%

Direct contributors use mostly information for decision-making
- 31%
- 19%

Managers use mostly information for decision-making
- 24%
- 25%

Executives use mostly information for decision-making
- 22%
- 25%

BI-Survey, 2021

Commercial feature

Q&A
Data analytics for pets

Mars Petcare aims to help transform pet care with artificial intelligence (AI) and machine learning (ML). **Matt Keylock**, chief data and analytics officer, describes the mission

Q How is Mars Petcare using data to help dogs and cats?

A Dogs and cats can't talk, so they can't tell us when they start to feel ill or otherwise may need healthcare. At Mars Petcare, we are using data and analytics to reveal new insights into pet health. By identifying changes in health as soon as possible, we hope to reduce the impact that disease can have on pets' wellbeing. We already have diagnostic tools that can help predict the onset of disease, technology that can detect changes in pet behaviour that could signal a change in wellbeing and we are using leading-edge data science applications to enable a new era of preventive pet care.

And it's not limited to healthcare. There are several areas of our business where we're using data science, from optimising supply chain and hospital operations to personalised marketing and retail assortment.

We are positioned to collect information on the behaviour, health and genetics of pets around the world through our nutrition, health and pet service businesses – and we want to use that privilege to be a force for good. Mars Petcare has a number of pet food brands, including Pedigree™ and Whiskas™, as well as Royal Canin®, our health nutrition brand. We're also very proud of our global network of more than 2,500 veterinary hospitals and diagnostic labs that employ more than 65,000 compassionate veterinary professionals.

We've got a DNA business called Wisdom Panel™, while Whistle™ helps us understand pet health through activity and behaviour tracking. Scientists at the Waltham Petcare Science Institute work to advance science to better understand pets' needs and overall wellbeing. The scale and granularity of this data across our businesses provide a phenomenal opportunity to generate insights that will help enable pets to live happier, healthier lives.

Q What is your latest breakthrough?

A Pet Insight Project is a pioneering mission to collect and interpret the health stories of hundreds of thousands of dogs. It's enabled by Whistle FIT, a smart, collar-worn device that captures information about a dog's behaviour – like a fitness tracker for dogs. It has a three-axis accelerometer to sense how much a pet moves up to 150 times a second.

Pet Insight Project invites citizen scientists to send in videos of their dogs doing certain activities, such as eating, drinking and scratching, whilst wearing the Whistle device. By pairing the data from the device with the video footage, we have built ML algorithms that can detect when dogs are exhibiting certain behaviours. We can now detect previously unseen behaviour patterns that could be early indicators of changes in wellbeing.

For example, an increase in the amount of time a dog spends drinking each day could be a sign of ill health, such as diabetes or kidney disease. We can notify the pet owner of these changes through the Whistle app, often before they have noticed the change in behaviour themselves.

Q How does your data help vets?

A Profession wide, it's estimated that the anaesthetic mortality rate is twice as high for cats as it is for dogs. We applied Natural Language

> **"**
> Pets make our lives better, and we're privileged to have the opportunity to use science and data to make their lives better too

Processing to unstructured medical notes and processed data from 1 billion raw medical notes, creating 300,000 structured anaesthesia records. Our research to try and better understand the risks associated with feline anaesthesia mortality has identified six unique risk factors. The next stage of this project is now in development - a predictive algorithm that can provide real-time feedback to veterinary teams to help make anaesthetic procedures safer for cats.

Q Tell us about your work in AI and ML

A Our AI and ML algorithms are written mostly in-house, but we also partner with third-parties and academic institutions. Another great example is our application of ML to X-rays. There is a dearth of veterinary trained radiologists globally, and a huge year on year increase in demand for radiological reads by veterinarians. Using 2.2 million X-rays, we have built ML models that can identify 42 findings in thorax and abdominal X-rays in cats and dogs, with many more findings to come. We can now provide a service to veterinary hospitals where ML can be used as an initial assessment for an X-ray.

We're also using predictive models to optimise our retail assortment, so that we can provide pet owners with more tailored product offerings.

Q How can data help in early disease detection?

A Chronic kidney disease (CKD) is the number one cause of death for cats over five and affects 30% to 40% of all cats over the age of 10. RenalTech™ is an AI-driven diagnostic tool that can predict whether a cat will develop CKD up to two years before traditional clinical diagnosis. It was developed by data scientists at Waltham Petcare Science

Institute using the medical data of more than 150,000 cats and 750,000 veterinary visits over 20 years. It's available to veterinarians through our diagnostic lab Antech's network. By having an early insight to the onset of disease, pet owners and veterinarians can partner to create a proactive, personalised care plan for the pet.

Q What does the future look like for pet care?

A A common use of AI in human health is the development of predictive models: where a computer can spot very subtle patterns in data that are an early indicator of a health condition or disease. Because so many diseases have better outcomes if they are picked up and treated earlier, predictive models have the potential to be transformative for pet healthcare, as in human healthcare.

We believe that going forward, we'll continue to tap into the potential of new technologies and tools to drive preventive and more personalised care, which can allow us to work harder and smarter to improve the lives of our pets. Already scientists are using the power of AI to not only understand how a pet's genetics and behaviour can share powerful insights about their overall health, but to also help predict disease in pets. Individualised nutritional support may ultimately help in the prevention and treatment of certain diseases. In the future, veterinarians and pet owners will be able to partner even better to keep pets healthy and happy.

Q What motivates your team?

A Pets make our lives better, and we're privileged to have the opportunity to use science and data to make their lives better too. By responsibly harnessing pet data, we have the opportunity to change the lives of millions of pets and the pet care industry. What motivates and unites us is our purpose: A better world for pets.

To find out more visit mars.com/made-by-mars/petcare

MARS Petcare

The rise of the chief data officer

CDOs are now essential to meet digital legislation and improve business outcomes. What does the role involve and how could it develop?

Dan Matthews

"D ata, data, data! I cannot make bricks without clay." So said fictional sleuth Sherlock Holmes, frustrated at the lack of evidence available to him. Today, this clay is everywhere, churned out by enterprises at eye-watering rates – and the onus is on modern-day Holmeses to use it to their advantage.

Step forward the chief data officer (CDO), whose job it is to collate and decode the many packets of information harvested by organisations minute by minute, then communicate, advise and construct an evidential basis for strategy.

US bank Capital One reportedly appointed the first ever CDO nearly two decades ago. More than half of the Fortune 500 now employ a CDO, according to research by NewVantage Partners. Despite this, the role remains embryonic.

In many cases, senior executives are the first to hold the position in their organisations. But, unlike the more familiar initialisms of CEO, CFO and CMO, the relative newness of the CDO role means that it has yet to be squarely defined. The same research found that 72% of organisations felt that the job description remains "unsettled", with only 28% calling it an "established" role.

So what is a CDO? What does a good CDO look like? What are their responsibilities, who should apply for the role and how could it develop in the longer term?

It's time to answer these questions once and for all.

The corporate demand for data-focused senior executives arose around the millennium, as governments started to regulate digital interactions. Legislators saw a need to steward data-based exchanges between people and service providers; The first CDOs were recruited to ensure that their employers toed the line.

But the role has evolved over the past 20 years. While CDOs remain an organisation's digital security guard, the job now encompasses elements of business development. Today's CDO is responsible for improving business outcomes by underpinning strategies, encouraging innovation and cutting waste, as well as by ensuring regulatory compliance.

"Paramount to the role is the ability to deliver measurable outcomes for the business," says Jonathan Westley, CDO at Experian in EMEA. In his view, the job is about change management, communication, and commercial acumen, not just number-crunching.

"These traits provide the ability to define a progressive roadmap that influences not only short-term improvement in data quality, but also the evolution and disruption of business models," he says. "CDOs help to quantify and prove the return on investment of data initiatives in the context of real business value – for

12% → 68%
The percentage of companies that had a chief data officer in 2012 and 2019 respectively

NewVantage Partners, 2019

instance, in revenue generation, customer satisfaction and operational excellence. In some businesses, they also set the guard rails for the use of data throughout the organisation."

The CDO's work may overlap that of the chief information, digital and/or technology officer, but the skill requirements are entirely different. While a CTO is responsible for the smooth operation of software and hardware systems and a CIO looks after digital assets, a background in IT isn't a prerequisite for a CDO.

More important is the ability to identify and prioritise high-value data, whether it's retail customer conversions, the efficiency of an engine or pressure points in a supply chain, and build a case for action that can be presented to the board. This means that storytelling is also a key skill.

According to Alan Jacobson, chief data and analytics officer at Alteryx: "While there are many similar-sounding job titles, data science leaders are typically agents of change who use data science to provide guidance to operations, as well as implementing new optimisation and automation into the business."

What company wouldn't benefit from a crystal-clear analysis of its employees, products, suppliers, customers and rivals? Couple this provision of mission-critical

> **"**
> CDOs help to quantify and prove the return on investment of data initiatives in the context of real business value – for instance, in revenue generation, customer satisfaction and operational excellence

information with data governance – the other string to the CDO's bow – and you have a role that feels indispensable.

Like oil, data takes time to locate and extract, while refining it is a complicated process. A company that has someone who can oversee all three tasks could gain a competitive edge over its rivals, especially if that person is helping to foster a wider data culture in the organisation.

"There isn't a specific company type that would benefit from embracing the power of data over another," says Justin Marcucci, CDO at Endava. "We live in a hyper-digital world. You'll soon get left behind if you aren't thinking about how your company can thrive in a digital context, using data to power the business."

But good data science can also move the needle beyond the realm of competitive commerce. In fact, it could save the world. Not-for-profit business accelerator Subak works with startups that combat climate change, providing tools to help them achieve their goals sooner. Its CDO, Dan Travers, says that packaging and sharing

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CDO in the spotlight
Ott Velsberg, government chief data officer, Estonian Ministry of Economic Affairs and Commmunnications

As the national government's CDO, my main role is to co-ordinate the use and governance of data. I work with organisations such as Statistics Estonia to help the government operate more effectively, turning raw data into practical measures.

One of the key areas I'm working on right now is the implementation of artificial intelligence in the public sector. This concerns how different departments and ministries can use data science in their work and how we can open up data to the public.

We're working on a data tracker, giving citizens information about how the government processes their information, as well as a consent management platform allowing people to decide whether private enterprises can access their information.

I started working for the government in 2018. At that point it didn't have a chief data officer, so I became the first one. Back then, we only had a couple of artificial intelligence solutions. Today, there are 80.

For instance, we have AI tools which can forecast how probable it is that unemployed people will find jobs. This helps us to estimate what sort of

pressure the country's benefits system will be under. We're working on measures to predict when someone will become unemployed, as well as increasing the likelihood of their finding a good job. The success rate of job recommendations by support agencies has risen by 20% since we started.

We also use systems that scan satellite images to check that farmers are spending agricultural subsidies correctly, which is easier than making site visits. The same tech also monitors forest fires and logging activity, as well as ice levels in the Baltic, which we use to guide icebreaking vessels.

We use data to determine which roads are more prone to traffic collisions and the main causes of those crashes. This helps us to set speed limits and select the most appropriate sites to install new safety infrastructure.

These are just a handful of examples of where we are putting data to good use, but the number of potential applications will continue to grow. In 2018, we had 18 datasets to work from. Today, it is more like 800.

A CDO must have management skills as well as technical ones. I consider myself as both a collaborator and a seller of ideas. This role is about selling ideas to various organisations and then, in my team's case, helping them to carry out the projects proposed, as they'll have little to no experience of what is going on.

CDO in the spotlight
Cindi Howson, chief data strategy officer, ThoughtSpot

My main role is to coach data and analytics leaders in our customer base, but I work to improve our cloud analytics platform too. I'm also the host of ThoughtSpot's *The Data Chief* podcast.

I advise people on what it takes to be a data-driven organisation, covering aspects such as managing the culture change required, achieving data fluency, modernising technology and generally getting their data house in order.

My role is different from that of the first generation of CDOs, whose main priority was to safeguard data and make it more accessible for analytics. That in itself kept them very busy. But being a CDO now entails driving cultural change and then working with key stakeholders in the business to gauge the outcomes. The optimisation process can entail ruthlessly ending legacy processes.

I therefore have to be a commercially aware connector, collaborator and politician. There are competing priorities on the table, so my job is about listening, understanding all the different business lines and helping leaders to agree on what should happen next.

It's important to take a balanced approach and not necessarily be swayed by the needs of profit centres. The HR function often comes last in use cases, but in the Covid era it has become vital to keeping the business running.

As a CDO who advises other CDOs, I deal with our customers' interesting data-related issues every day. They might come to me with what they think is a crazy idea – and I'll tell them what happened when another business tried the same thing, the challenges it faced and what they should look out for.

One of the most common questions that CDOs wrestle with is whether they should be more open with their data – for instance, by setting up an internal data marketplace so that the whole organisation can view the contents.

Others go further and want to know if they should share data with customers as it's being generated. A manufacturer might be considering whether to share real-time supply chain data with a retailer, say. The technology makes this possible, but it would represent a big shift in the company's business model.

There are so many opportunities to work with data. All organisations, no matter what size, should have someone whose job it is to make it work for them.
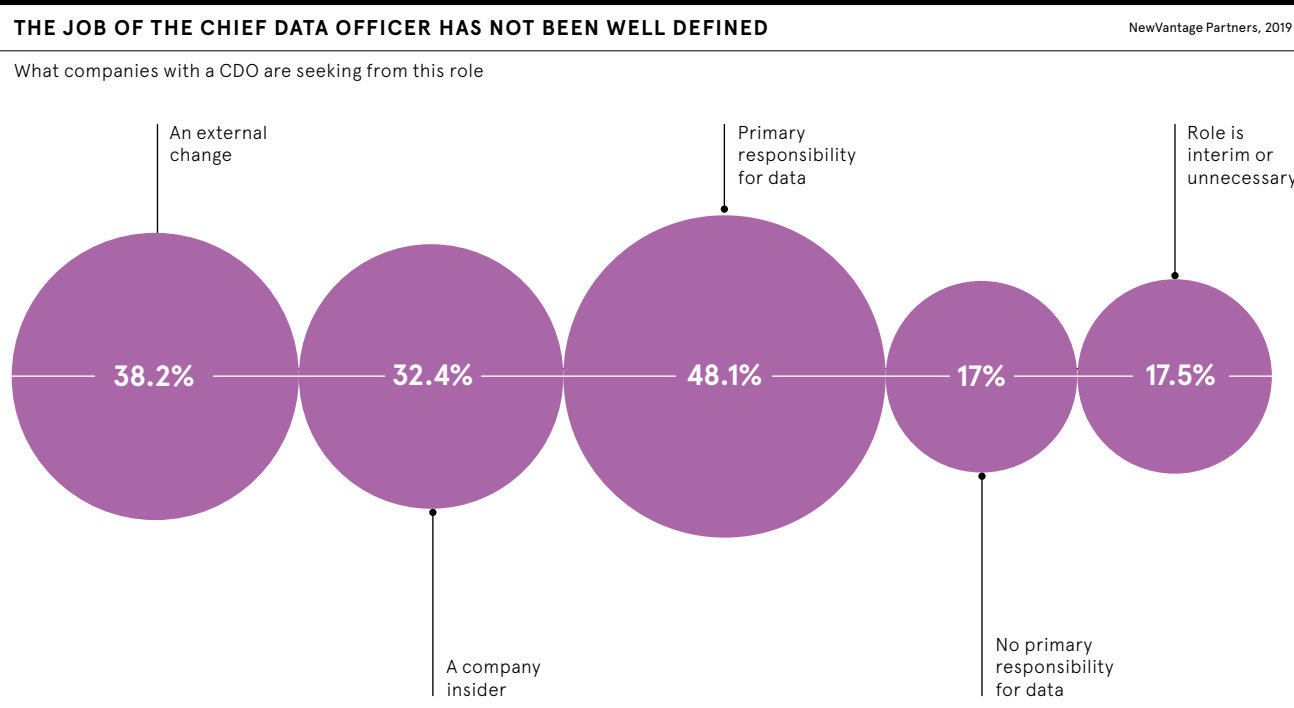
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data is implicit in solving the world's most pressing problems.

"Ensuring that data is stewarded correctly and dispersed across the organisation as smoothly as possible can be the difference between success or failure for a business," he says.

Subak is collating and sharing climate data with all organisations that have an interest in the issue, including businesses and public bodies. "We want to apply best practices to this climate-related data to ensure that the essential action to address climate change can move as fast as it possibly can," Travers says.

It's an idea whose time seems to have arrived. A recent Experian study has found a growth in the number of for-profit enterprises using their data muscle in aid of non-commercial goals. Nearly 80% of business leaders said they wanted to contribute to societal good in light of the pandemic, mainly by sharing information.

Questions about the importance of data were settled long ago. Everyone around the boardroom table gets it, even if they

THE JOB OF THE CHIEF DATA OFFICER HAS NOT BEEN WELL DEFINED
NewVantage Partners, 2019

What companies with a CDO are seeking from this role

An external change	A company insider	Primary responsibility for data	No primary responsibility for data	Role is interim or unnecessary
38.2%	32.4%	48.1%	17%	17.5%

> "We live in a hyper-digital world. You'll soon get left behind if you aren't thinking about how your company can thrive in a digital context, using data to power the business

don't understand it, so data departments will receive more time, energy and money over the coming years. That means more CDOs and, probably, more power and accountability for those taking on the role.

But a greater reliance on data to track consumer trends, for example, will produce a new breed of CDOs who are highly diplomatic and empathetic, capable of communicating the benefits of increased data-sharing with stakeholders including the government and the public.

The future CDO will be multi-talented, operating at board level above most – perhaps all – other technology roles. Dr Shorful Islam, CDO at brand consultancy Tribal Worldwide, believes that this will give the role huge organisational influence and a budget to match.

"As data increases in importance, the CDO will become a board-level position. It will be a value-generating role, as data is seen more as an asset. Over time, the CDO will have major budget-signing authority – just as marketing has had over the past couple of decades – as more technology is required to collect, store, safeguard, process and analyse all the data."

Within the space of two decades, CDOs have gone from novelties to vital commercial assets. As organisations rely more on insight and data's value skyrockets, it's hard to imagine a universe in which their influence doesn't continue to soar. ●

AI: the affordable technology transforming today's businesses

With businesses generating more and more data, an investment in AI to help drive insights is now business critical

If data is the new oil in an age when businesses are defined by what they do with it, then artificial intelligence and machine learning are the new engines - potential powerhouses of economic growth with the ability to unlock business value. With so much data now being generated globally, the need to make sense of it, act on it and then stand out from the competition is vital.

"At no point in history have we generated so much varied and rich data. Together with the prevalence of cloud migration, this is rocket fuel for business intelligence generated through data-driven insights. Yet data is still an underutilised asset. Those that are differentiating themselves are using artificial intelligence and machine learning effectively, making a real difference to their top and bottom line," explains Neil Miles, CEO and co-founder of Inawisdom.

Inawisdom is an AI and advanced analytics specialist and Amazon Web Services (AWS) premier partner that counts JCB, AO.com and Johnson Matthey among its customers. Recently acquired by Cognizant, the company is based in Ipswich, with offices in London and Rotterdam and employs over 100 staff. In 2020 Inawisdom was named the AWS Machine Learning Partner of the Year.

Using AI to drive transformational change
In 2020 each of us generated 1.7 megabytes of data per second, which is more than 2.5 quintillion bytes every day. By 2030, AI will contribute $15.7tn to the global economy, according to PwC. It could also drive greater product variety and boost productivity, as AI accelerates.

"Already businesses are deploying AI to deliver transformational change, whether it's in manufacturing, retail, agriculture or utilities," says Miles.

"AI and machine learning-driven insight allows businesses to personalise product offerings, reconfigure supply chains or generate operational efficiencies. We've seen significant performance improvements, including seven figure sums ploughed directly into the bottom line of businesses or a 70% to 80% shift in key metrics with a relatively small investment. Gains come quickly because of the richness of data and the power of the cloud."

AI services that were once only available to enterprise organisations can even be deployed by startups. State-of the art, cloud-based tools can be used cost-effectively by any organisation, of any size.

"Forward-looking organisations are now grabbing this opportunity. AI is not a technology for technology's sake, this is about generating tangible business outcomes. It's about a sense of discovery - identifying where you can have the best impact. Very quickly businesses can generate insights they never would have been able to do and then decide on where best to invest," says Miles.

"Traditional data-driven IT projects used to be long-term, long-cycle investments, now within weeks we can generate machine learning models and insights that revolutionise businesses. Global powerhouses like AWS and Intel have made cloud both accessible and scalable, enabling AI to be deployed rapidly and cost-effectively."

Investing in AI
Yet for some, the use of AI is still viewed as an investment for the future, rather than the present. These tools are perceived to be too complex or require clean data sets that companies don't possess. It is also not seen as a priority for businesses that have other operational concerns, with data privacy continuing to be an issue.

"There may also be fear of the unknown, the hype or questions around how to get started. Yet machine learning models can be deployed safely, simply and quickly. Start small and scale. We support customers to get them beyond the inertia point, helping them discover the value of advanced analytics and AI. It can be a leap of faith, but the results speak for themselves. All data is valuable, from text to voice to images; the possibilities are incredible," says Miles.

"If AI is benefiting our personal lives, why would it not benefit our business lives, whether it's forecasting sales, improving operational processes or driving sustainability metrics? We can now tackle the big issues across every industry. The breadth of its usage is astounding and the future looks bright."

For more wisdom on AI go to www.inawisdom.com

"We saw a

74 %

increase in the accuracy of transit-time predictions due to machine-learning"

Mohammed Sleeq, CDO, Aramex – an Inawisdom Customer

Data-driven HR is coming – is your department ready?

HR chiefs could be sitting on a data goldmine, but they may first need to upgrade the analytical skills of their own teams

Sally Whittle

mavo via Shutterstock

The HR function is operating in an increasingly data-driven world, with opportunities in recruitment, retention, development and beyond. But, to realise the true potential of data, many HR leaders need to upgrade their resources.

Data-driven HR relies on capturing, analysing and applying data to improve the organisation's decisions about everything from recruitment to development. Used correctly, HR data can help to accelerate the recruitment process, reduce staff turnover and enhance employees' skills.

Many HR teams have a huge amount of data at their fingertips, yet they don't necessarily have the skills or resources to use it. So says Ben Eubanks, chief research officer with Lighthouse Research & Advisory, a US-based human capital management analyst.

"There are very few data analysts in HR," he says. "But, by focusing on a narrow set of traditional HR metrics, you're limiting yourself to a pencil sketch when you could be looking at the full high-definition picture."

Many HR teams have upgraded their recruitment processes during the Covid crisis, replacing interviews with data-based recruitment assessment tools. Applicant tracking systems automatically collect, sort, scan and rank online job applications. This can give HR managers access to data such as candidate demographics, the source of applications and time-to-hire figures.

This means that they can determine which channels bring the best results and allocate budgets more effectively. One such user is IT services firm Logicalis Group, which is rolling out the Workday HR platform globally, replacing several smaller ATS products used in different regions.

Accessing global HR data has been hugely beneficial in the Covid era, according to the firm's group senior vice-president for HR, Justin Kearney. "We've learnt during the pandemic that many roles can be completed remotely, so that allows us to open up recruitment to cross-border applicants and assess applications remotely," he says. "Having access to better HR data in recruitment means we can target different regions where we know skills are more readily available."

HR data gives global auditing firm Bureau Veritas a strong competitive advantage in recruitment and retention, says its vice-president of talent acquisition and retention, Trent Cotton. His team faces a range of challenges in hiring qualified "inspectors", including an ageing talent pool – many of the firm's inspectors have been recruited after retiring from other employers.

Cotton highlights first-year staff turnover as an important piece of data. "If we can identify the quick quitters, that data can be combined with ATS data so we can see where those people came from and understand if it's the hire source that's a problem or if there's a management issue to address," he says. "Ultimately, it helps us to hire better and retain people better."

As HR departments develop their data skills, there is potential for them to use more sophisticated tools, notes Eubanks, who adds: "Most HR teams use something like an ATS, but true data-driven HR means pulling in data from other systems so you can understand the complete 'employee journey'."

UK retailer Next Online is working with Arctic Shores to provide data-driven recruitment insights from a neuroscience-based assessment that captures 12,000 data points about applicants and distils them into scores for 35 different personality traits.

This information is mapped against a role description and used to rank candidates. When combined with ATS data, it provides a fairer, more accurate recruitment process.

At the start of the project, Next's HR team couldn't understand why its existing recruitment data had identified so few women as preferred candidates for technical roles. Robert Newry, CEO of Arctic Shores, takes up the story: "Once we used our assessment to score candidates and then mapped that data against the traits the job actually required, the number of women identified for one role jumped from zero to 20 out of 120."

Eubanks believes that the potential of data-driven recruitment lies not only in tracking current HR activities but also in anticipating business requirements that will affect HR strategy. "We need to get to a place where we can use HR data to improve our ability to predict future business needs and make better strategic decisions," he says.

Logicalis Group uses employee listening technology from Peakon to continuously monitor engagement levels. Peakon survey results are combined with ATS data to give insights into the likely level of staff attrition. "We can predict by location, team and function – and that data feeds into our recruitment plans," Kearney says. "It's a bit like the *Minority Report* of HR, but I think it has the potential to be a game-changer."

At Bureau Veritas, Cotton is using Google Data Sheets to pull data from various HR applications and to share dashboards with colleagues. This is a low-cost way to distribute important HR information and it also helps to raise the department's profile, he says. "It can show things such as likely expenditure, turnover and so on. Such data is really meaningful to my colleagues. I think sharing data across the business is pivotal in creating transparency."

First, though, organisations must address the lack of data analysis skills in many HR departments – a field in which the profession hasn't traditionally excelled. Eubanks would advise HR chiefs to take a "build, borrow, buy" approach to developing data skills.

"It may be that you have a team member with a natural bent for data and you can upskill that person. Otherwise, you might find someone in operations or finance who can devote some time to working with HR data," he explains. "If that fails, hire someone with appropriate data analysis skills."

Logicalis is actively seeking HR data specialists in more mature markets. According to LinkedIn, there has been a 242% growth in the number of HR professionals with data skills on its network over the past five years.

Cotton says that incorporating more data and data skills is a top priority for his team. "I love numbers, but a lot of my colleagues are statistics-averse. We're going to have to be more number-informed, because it blows my mind how much information HR teams have that they don't do anything with." ●

> **Having access to better HR data in recruitment means we can target different regions where we know that skills are more readily available**

55%
of companies say that they need help with basic people analytics

73%
of companies consider people analytics to be a high priority for them over the next five years

242%
increase in the number of HR and recruitment professionals with data analysis skills listed on LinkedIn over the past five years

LinkedIn, 2020

TECHNOLOGY

Transforming healthcare at the edge

Edge computing holds great promise for healthcare, placing data where it's needed most and supporting new technologies

Danny Buckland

Healthcare faces a daily battle with rising demands, strained finances and the fall-out from the Covid crisis. Could so-called edge computing be its saviour?

The term lacks the charisma of a new wonder drug or the political drama of a multibillion-pound funding programme. But it has significant potential to tap into the oceans of valuable data that are washing around the healthcare sector.

Edge computing is a physical infrastructure outside a cloud set-up or central data system that enables staff to access and analyse data – patient and clinical information – swiftly, cleanly and locally. The technology's transformative potency comes from taking the data generated every day by hospitals, clinics and wearables and placing it close to where it's needed most, rather than in a central repository where bandwidth and latency are barriers to its use.

Edge computing eliminates latency – the time taken to access the right data – and creates opportunities for improved response times and more comprehensive insights. It could empower technology for at-home monitoring, telemedicine and scaled-up virtual services, along with smart systems and real-time diagnostics. This is mission-critical for the new care models needed to alleviate the problems that blight traditional reactive care.

The edge is proving powerful across industry and retail, where it has a clear impact on the bottom line. Grand View Research predicts that edge computing will achieve a compound annual growth rate of 38.4% from 2021 to 2028.

Health services can be slow to adopt technology, but the edge is beguiling because it offers efficiencies from using data smartly at source. It could also be a gateway to new systems such as 5G networks, augmented reality (AR) and virtual reality (VR).

"This is the year of the edge," declares Laura Foster, programme manager, technology and innovation, for techUK, a trade association for technological innovators. "We are generating so much data and it doesn't make sense to send it all to the cloud. It makes sense to process the data as soon as you can, so that it can be used where it's most needed."

The boom in smart and wearable tech has created waves of data that can swamp conventional networks and delay vital content such as X-ray and MRI scan results from reaching clinicians. Edge establishes local data networks with easy access, leading to ultra-fast diagnoses and decision-making, while liberating clinicians from laborious data-processing duties.

It's gathering momentum across the NHS, although the cost of new hardware and software is a significant barrier.

"It is going to be transformative. I'm excited about how it empowers the adoption of tech such as AR and VR in healthcare," Foster says. "It will be crucial over the next decade in dealing with the backlog caused by the pandemic and offering new opportunities for care models."

Better monitoring of patients remotely and the use of telemedicine can reduce the number of hospital admissions and allow agile services to thrive at a local level, she adds, although progress will be tempered by the ravages of the pandemic.

These are early days for edge computing; belief, investment and training will be needed for it to make significant progress. A recent report by Aruba, a wireless networking subsidiary of Hewlett Packard, has found that 92% of IT decision-makers are missing skills, principally in artificial intelligence and machine learning, to unlock the power of data.

Edge computing increases the amount of data in circulation, which can heighten cybersecurity risks. A report at the end of 2020 found that 57% of IT decision-makers surveyed thought that connecting devices at the edge had made, or would make, their organisations more vulnerable.

David Wyndham Lewis is a former NHS trust CIO who now serves as health and life sciences director for northern Europe at IT group Atos. He believes that it will be "an immense challenge to find ways to assure security and privacy alongside exponentially increasing volumes of data and the decentralisation of its collection".

But Wyndham Lewis adds that edge computing does address many of the bottlenecks to true digital transformation in healthcare. "We're moving into a world in which every person is increasingly digitally connected by their smartphone or watch. These devices are creating a torrent of clinically valuable data," he says.

As long as hospital systems aren't set up to process this data, clinicians can neither review it nor respond to it.

Atos is participating in schemes that are using a range of monitors to help care for elderly people at high risk of falling and/or getting lost. Connecting those devices and keeping their data local has improved response times and standards of care.

"Edge computing offers us a chance to improve the care delivered to a patient and provide data that could be used for the wider good," says Wyndham Lewis, adding that it helps to move healthcare from a reactive model to one that focuses on the maintenance of wellbeing – the only way to tackle the UK's demographic shift while providing good and improving care.

He concludes: "For this to take place, we absolutely have to have that local decision made or local intelligence applied to the data. Otherwise, our current healthcare systems and our clinicians will just be overwhelmed." ●
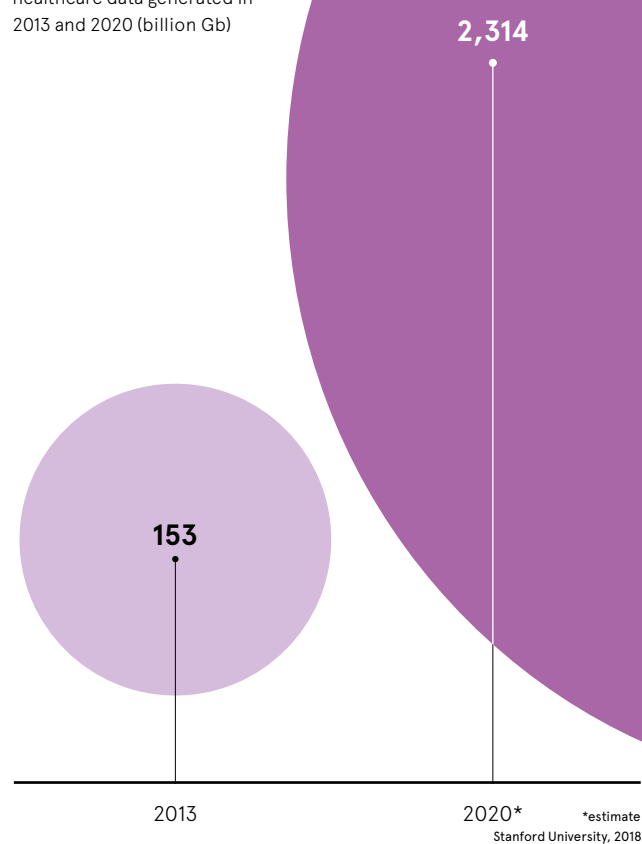
EDGE COMPUTING IS ON THE RISE

The proportion of enterprise-generated data that's being created and processed outside a centralised data centre or cloud

10% (2018) **75%** (2025)

2018 — 2025

Gartner, 2018
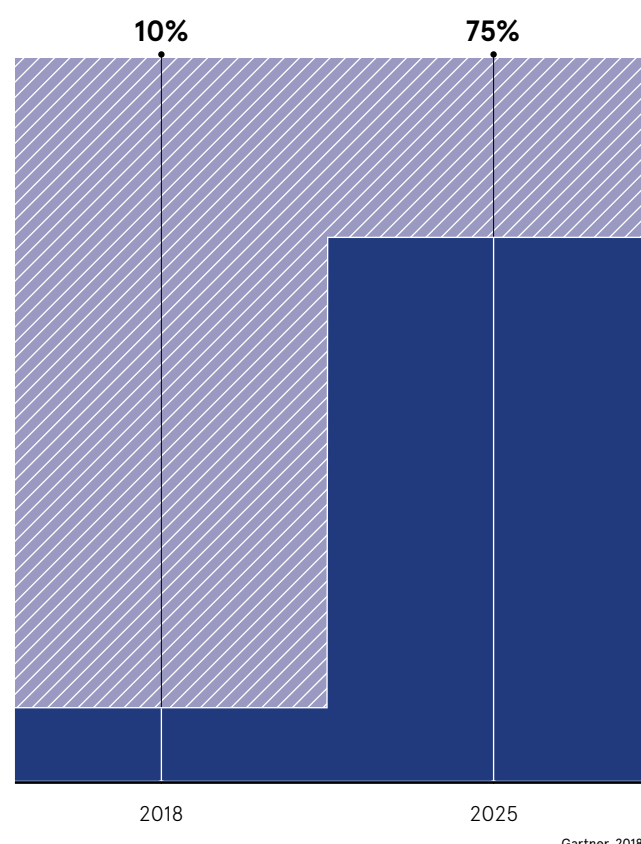
THE GROWTH OF HEALTHCARE DATA

Total volume of global healthcare data generated in 2013 and 2020 (billion Gb)

153 (2013) **2,314** (2020*)

2013 — 2020*

*estimate
Stanford University, 2018

Q&A
Digitised market intelligence powers smarter decision-making

Dean Curtis, president and CEO of commodity intelligence company ICIS, outlines the importance of real-time data in supporting energy and chemicals firms through unprecedented disruption

Q How have commodities markets and supply chains for valuable resources been impacted by the Covid crisis?

A Early in 2020, we saw a steep decline in prices in most industries amid the uncertainty. However, this volatility wasn't only driven by Covid. The energy and chemicals industries had to deal with a double Black Swan event with both Covid and the Saudi-Russia oil dispute. Crude oil prices also collapsed in record time.

In the chemicals industry, we've seen supply chains impacted by additional extraordinary events in quick succession, including the Suez Canal obstruction and extreme weather in places such as Texas. In many ways volatility has become the new normal. But commodities industries have responded extremely well, as we began to see the power of data and insight come into play and how businesses can make better use of it.

The chemicals industry has contributed significantly to the Covid response. Isopropanol (the chemical used commonly in sanitising products), ethanol, caustic soda and obvious things including packaging, face masks and cleaning products have played a vital role in the prevention of the disease. There was also a huge increase in demand for polycarbonate and polymethyl methacylate sheets for protective perspex or plexiglass screens in hospitals, shops and restaurants. Businesses changed and adapted very quickly based on the needs of the world.

Q How important has data been in helping businesses navigate these challenges?

A Data has been incredibly critical. Often crises accelerate trends and that's certainly been the case with Covid and digitisation. Despite the fact that this was an industry founded on innovation not that long ago, there has been a degree of inertia, particularly around digital transformation. But businesses are finally recognising the value of data and are refining how they use it to improve results - and not just financially.

In a recent ICIS global survey, more than half of the 1,000 C-suite chemicals and energy execs surveyed said they are automating traditional industrial practices using data and smart technology. The commodities in this world and our resources are precious, and they need to be used in ways that are efficient and precise. Data makes the difference in how that's done, but it's only useful if used in the right way. We now often deliver less but more specific data. But because it is provided at the right point in the decision-making process, it is more useful for businesses and so has a lot more value to our customers.

Q What kind of digital transformation have you been through in order to provide the right data intelligence to your clients?

A As we've partnered with the industry, we have seen our clients accelerate their need for digitisation and data. Some of these commodities, while very valuable and prevalent in the world, are a lot more illiquid than other trading markets. For example, commodities are now priced weekly, monthly or even quarterly, and because of the huge level of volatility, people need timely access to the latest intelligence, which increases the need for digitisation.

We see this in both the volume and frequency of our data that is being accessed. Like our parent company RELX, at ICIS we have been investing heavily in digital transformation and recently launched significant enhancements to our customer platform, ICIS Digital. Ten years ago, our customers either received print or PDF price reports. In today's pace of business and the real-time nature of trading, this would not be efficient.

Our customers can now access a sophisticated digital platform that connects data, customers and markets like never before, or have the data delivered straight into their systems, processes and analytical models. From our pricing intelligence to our analytics offerings, we empower our customers with real-time data and insight. Ninety-nine of the top 100 producers use ICIS data to make strategic decisions, mitigate risk, improve productivity and capitalise on new opportunities with our targeted connected intelligence.

Q How are AI and machine learning technologies impacting the world of data?

A AI and machine learning are having a huge impact - and not just in driving efficiencies. Computers won't fully replace humans any time soon, but computer technology with human ingenuity provides an opportunity to see further and adapt faster, something businesses are still trying to manage as they seek to extract value from these capabilities.

When looking at digitisation overall, 10 years ago most businesses saw data as a bit of a problem. They had all of this data, in different formats and siloes, that was difficult to manage and so often was overlooked. Now data has an enhanced value based on its ability to be relevant and useful, and AI and machine learning are incredible tools for uncovering value faster.

In our markets we've seen a massive increase in the past year and a half not just in engagement with our content, but also the need and desire for a more forward-thinking approach. This is done through forecasting content and analytical models, which enable businesses to make longer-term strategic decisions.

Q What role will data play in defining success in the commodities markets in the years ahead?

A Supply chains are being shaped by thousands of decisions every day, but so is the world. The interconnected influence of decisions has a huge impact and the pandemic shed light on the importance of data and digitisation. Data now connects every human and most of the goods on our planet.

In the commodities markets, businesses will start to understand that sometimes it's the data you think you don't need that actually gives you an advantage. The leaders in the commodities markets have similar characteristics, one being digital businesses that can make agile, data-driven decisions. This will become even more critical in the years ahead.

Our data and analysis have shown businesses how disrupted the chemical markets have become and helped them navigate through the chaos, which has led to many opportunities. We have pinpointed record-breaking fluctuations in chemical prices and margins, tracking supply and demand in real-time as well as highlighting where and when any disruption occurs.

Armed with these insights, our customers have a sense of security when monitoring for supply within a market where prices are constantly changing. Every business on the planet needs to think in a more agile way. The investments we've made in the transformation of ICIS to become more digital, means we can continue to empower smarter decisions that help optimise the world's resources.

> **The majority C-suite executives stated their firm was automating manual tasks, with more than two-thirds of heads of procurement selecting this option**

DIGITAL TRANSFORMATION ACROSS CHEMICAL AND ENERGY MARKETS

2/3
heads of procurement say their firm is automating manual tasks, as do the majority of C-suite executives

60%
of chemical manufacturers say they are automating manual tasks, the most among all industries, though utility companies are close behind with 52% automating manual tasks

32%
of firms are focusing on new business operating models that better align with digital transformation goals

I·C·I·S
Independent Commodity
Intelligence Services