DATA & INTELLIGENCE

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Contributors

Marianne Curphey
An award-winning financial columnist and blogger who writes for a range of publications. She was previously a staff writer at *The Times* and *The Guardian*.

Charles Orton-Jones
An award-winning journalist and former editor of *EuroBusiness*. He specialises in writing about fintech and high-growth startups.

Kate O'Flaherty
An award-winning cybersecurity journalist with well over a decade's experience of covering issues affecting consumers, businesses and governments.

David Stirling
A freelance journalist writing news and feature articles for publications including national newspapers and business magazines.

Raconteur

Campaign manager
Narinder Hayer

Reports editor
Ian Deering

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Design
Harry Lewis-Irlam
Colm McDermott
Samuele Motta
Sean Wyatt-Livesley

Illustration
Kellie Jerrard
Celina Lucey

Design director
Tim Whitlock

@raconteur raconteur-media @raconteur.stories

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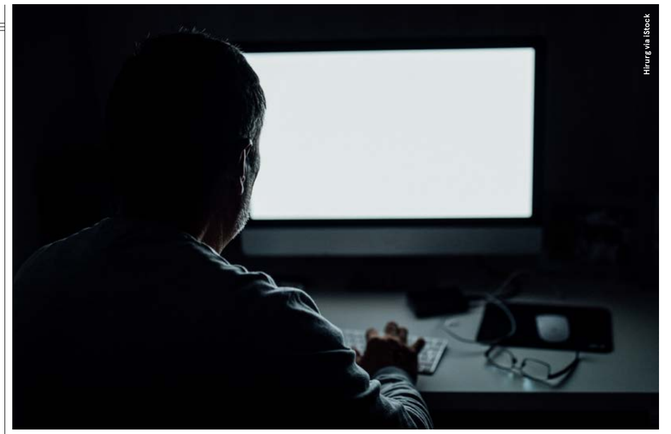
DECISION-MAKING

Choose life: does your firm have a big data habit to kick?

Businesses are collecting data on virtually every aspect of their operations. But do they need to if this isn't improving their decisions? Perhaps it's time to break the dependency

David Stirling


Hiroz via iStock

The digital lives we lead generate mountains of data, from the exercise stats compiled by our wearable devices to the trails we leave as we click, tap, type and swipe our way around the internet. The search terms we enter and the transactions we make online are sliced and diced by firms eager to understand our preferences and point us towards yet more content that might satisfy these.

If the proliferation of data continues at its present rate, it's likely that more than a yottabyte (a million trillion megabytes) will be generated annually by 2030.

But, even though 97% of businesses have invested in big data applications, the average company analyses only about 40% of what it collects. According to a recent survey by cloud computing firm VMware, 83% of business leaders believe that their firms have more data than they need.

As a recession looms, these executives are worried about getting lost in the weeds. They fear that their inability to unlock the full value of all the material at their disposal is making their enterprises less innovative and reducing their ability to spot new growth opportunities.

"Clients are becoming addicted to data," reports Ben Gallagher, co-founder of B+A, a strategic consultancy and research provider. "Given the growth of ecommerce and direct-to-consumer channels, there is a belief that you have to track everything to hyper-target shoppers. But this notion serves as a safety net for firms rather than necessarily clarifying any business decisions they make. The problem is that the data tells us only what's happening right now. That changes all the time, so businesses feel that they have to keep gathering more data to stay abreast."

Marc Warner is the co-founder and CEO of Faculty, a specialist in artificial intelligence. He believes that business leaders are being naive when it comes to data collection.

"There's a prevailing wisdom that more data leads to better decisions. But, if we have 50 times more data than we did in 2010, why aren't we making decisions that are 50 times better?" Warner says. "Businesses collect a load of data, which doesn't give them the insights they were hoping for, so the answer from their tech teams is 'collect even more of it'. If you're looking for a needle in a haystack, there's no point in making the haystack bigger. We have even heard from CEOs, surrounded by 50 flashing dashboards, that they can't say 'no' to their tech teams. They don't want to be seen as dinosaurs."

Gallagher argues that it's a good time for business leaders to take a fresh approach, given the seemingly unpredictable turn the world has taken in recent years.

"How many data analysts foresaw Brexit or the rise of Trump? Such events have shown that the human condition is way more unpredictable than the data allows for," he says. "We do need baseline data and analysis, but we also need to focus on what motivates people to make specific choices. If I'm a tea-bag manufacturer and my data tells me that most people like a cup of tea at 9am, for instance, I need to join them, make a cuppa and find out why."

Indeed, Gallagher has encouraged his staff to "get out into the world" and try to make sense of it using as many stimuli as possible. "I want them to develop their intuitive muscles so that we can develop strategies in tune with where the world is and where it's going," he explains.

This more intuitive approach to analysis has also found a champion in Euan Andrews, CEO of digital consultancy xDesign.

His advice to businesses would be to "take the time to work out what insights you're looking to gain from data collection and build out your strategy and processes from there. Then just collect what you need. We need to treat data as one strand in the decision-making process."

That data doesn't have to be digital. It could be the experiences of employees or the reporting of respected publications, says Andrews, who adds: "It's only by gathering all these strands together that you can make informed decisions."

While it's clearly crucial for businesses to keep gathering and analysing data, a partial "detox" to clear employees' heads wouldn't hurt, according to Warner. That matters, he explains, because the human brain has its limits. "It can only consume so much data. Once you get past that point, you lose all understanding."

With this in mind, Faculty has created AI-based software that's designed to help firms sift through the mass of irrelevant material.

"Its users can determine which data is important by unpicking the cause-and-effect relationships in their business," Warner says. "We start with a decision that an organisation must make – for instance, how many hospital beds the NHS could expect to need during the Covid crisis. You work out what data you require to inform that decision, rather than compiling several data sets that don't relate closely to it."

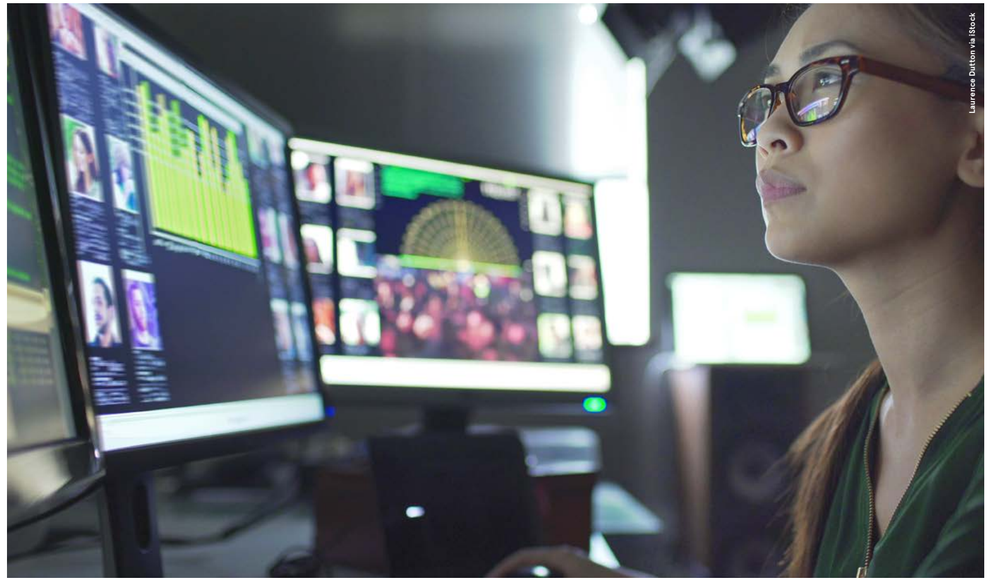
Companies that have spent heavily on data collection and analysis are understandably eager to see a return on that investment, he adds, predicting "a huge trend over the next few years in how they best make use of their assets – through both data and gut instinct".

> **If we have 50 times more data than we did in 2010, why aren't we making decisions that are 50 times better?**

59% of C-level executives think organisations that are prioritising data-led decision-making are gaining market share

58% fear that their companies will fall behind the competition if they fail to make better use of their data

VMware, 2022



Laurence Dutton via iStock

> **Data needs to flow like a river through your organisation. It cannot be stuck in a fetid pool**

ANALYTICS

Torrential essentials

Stream processing software enables organisations to handle a constant flow of big data efficiently. This is a saturated market, so choosing the right stack is likely to be a challenge for any business

Charles Orton-Jones

There's nothing cooler than working in space. And, for anyone who dreams of making it to the final frontier, Open Cosmos is the enterprise to get involved with. OK, it won't actually put *you* into orbit, but it is a one-stop shop for all your galactic needs.

"We want to give everyone access to space," says Pep Rodeja, a software and aerospace engineer at the company. "We have our own satellites. We manufacture them, operate them and maintain them. If a company comes to us and wants to use a satellite to measure something on Earth, we'll make it happen. We manage it all: we find the launch provider, arrange the insurance and operate the satellite."

Open Cosmos has two low-Earth-orbit satellites circling the planet. One collects data from internet-of-things sensors located in places such as ocean-going container ships; the other supports 5G telecoms networks. The company is also planning to launch meteorological satellites from the new Spaceport Cornwall facility near Newquay.

One of the biggest challenges facing Open Cosmos is how to maintain its extraordinarily sensitive hardware, Rodeja says. "Our satellites generate telemetry from their sensors. Everything that can be measured is measured. If a sensor goes high on temperature, say, an alert is generated."

These sensors produce a huge volume of data, which presents users with a key challenge: how best to handle the constant flow of material they send?

The stream processing debate is red hot in tech circles right now. Many enabling technologies are on the market, which can make selecting the most appropriate software a challenge.

For Open Cosmos, it needed to be an open-source solution, because its engineers wanted to know exactly what was going on at code level. It also had to be cloud-native, to take advantage of the cloud-hosted systems the company was already using, and ultra-reliable.

"We chose VictoriaMetrics," Rodeja says. "The fact that it's open source was important to us. If we had purchased a closed-source product, we'd be at the mercy of the provider. With open-source software, if we need something and the community does not agree, we can always ditch it and do it ourselves."

VictoriaMetrics is a relatively new name in data stream processing. A Ukrainian enterprise, it markets itself as an alternative to the more established platforms in the market, which include Prometheus, Grafana Mimir and InfluxDB.

The most common choice is between two open-source products: Kafka and Pulsar, both of which are overseen by the not-for-profit Apache Software Foundation. Kafka was created at LinkedIn and open-sourced in 2011. Pulsar is newer, originally developed by Yahoo and open-sourced five years later.

"No one has ever been fired for using Kafka," says Dom Couldwell, head of field engineering in EMEA at DataStax, a database-as-a-service provider. "It has been around a long time. But one of the things I hear more and more about it is its monolithic architecture. This was great when Kafka was first built, but it is becoming a problem."

Both products have built up a huge user community that will offer support, he adds. But Pulsar "has been getting more active contributions than Kafka on average in the past 18 months, so things are changing."

The differences between them are arcane, but in simple terms Pulsar is more versatile, rather like two products in one. It incorporates a queuing system, usually run by a package such as RabbitMQ. It scales smoothly by breaking log files into segments. Its distributed architecture means that there is no single point of failure. It's faster than Kafka, according to various benchmark tests. And it natively supports geo-replication, meaning that data is backed up across different regions, which adds to its reliability.

It's worth having a debate about which method works best, according to Couldwell, who includes several other technologies in his assessment. The trick for non-technical folk is to ask whether the data is truly streaming "in real time" and across functions. If not, the IT team has some questions to answer.

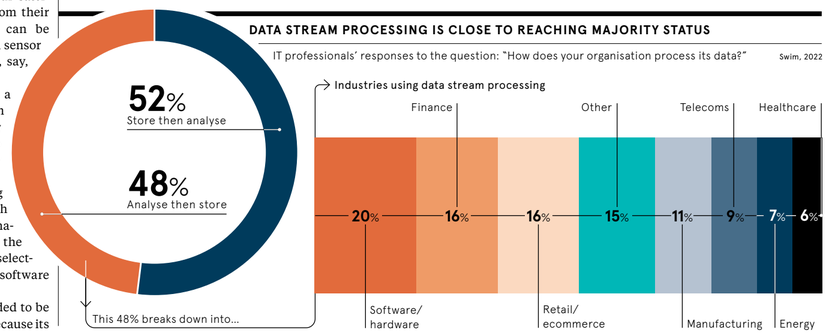
"Data needs to flow like a river through your organisation," he says. "It cannot be stuck in a fetid pool."

Naturally, specialisms bring their own requirements. Data steaming cuts across many industries, devices and tech stacks. Mobile app developers, for instance, have numerous tools at their disposal that are already engineered for the job.

Android app expert Ivan Kuzlo is director of engineering at CHI Software, a development service provider based in Lviv, Ukraine. He can rattle off a long list of solutions that work, but he says that there is no one best technology. Ultimately, it boils down to choosing the one most suited to the specific task at hand, which may result in one company using several products.

CHI, for instance, uses "Google Analytics and Data Studio for user flow and behaviour. To measure activity in the app, we use Firebase analytics. For other projects, there is BigQuery," Kuzlo says. "It depends on what you need. It may come down to your timeframe and budget. There's no point in a developer telling its client what the best solution is if that would take 10 years and the whole budget to implement. The best thing in the early stages of any project is to look at the options and understand what each one means."

In the end, the stream processing debate is complex because projects are too. Sometimes, a developer will simply want to monitor what's going on with an app. That's a different order of complexity from sending a satellite into the heavens. ●



Commercial feature

Tapping into the shared value of data

Organisations are sitting on a trove of valuable data, but viewing these insights in isolation could be stifling progress. A new push for open innovation is helping businesses level-up together

When open banking came into force in the UK in 2018, the idea was to make it easier for customers to compare banking services and encourage competition among banks. Since then, an entire ecosystem of financial technology businesses has emerged, underpinned by data sharing through open banking APIs. The success of open banking has not only helped reshape the industry but has also highlighted new opportunities for organisations to collaborate on data and embrace open innovation.

"There hasn't really been a consensus on how to do this until open banking set the benchmark for this federated approach to data sharing," says Jamie Ingram, engineering director at BCG Platinion. "There's now a snowball effect with open banking as a blueprint for how data can be exchanged securely to facilitate innovation because we now know it works."

The first step in this process is identifying potential use cases that can create value for the business and its customers and drive societal change.

Tom Howe, lead engineer at BCG Platinion, explains: "Once they have identified that use case, they need to source the data. We encourage organisations to look inwards as they may already have useful data available but don't know how to access and use it. There are then steps they can take to look outwards to find the data they need."

He adds: "By actively engaging in, supporting and contributing to existing open and shared data initiatives, they can really engage in this idea of collective action. They can establish partnerships, collaborate, and can even orchestrate their own ecosystems."

Sharing data can support companies' net-zero initiatives. The CO2 AI Product Ecosystem, developed by CDP and CO2 AI by BCG, is an AI-enabled platform that allows all members of a company's ecosystem to exchange product-level data, empowering organisations to understand their carbon footprints and meet their carbon reduction targets.

"There is an absence of data around what companies might need to move to net zero," says Howe. He highlights data gaps that companies may be overlooking, which could help build cleaner supply chains or provide input to algorithms to reduce scope three emissions. "There are huge opportunities to discover data that helps design better places to live and work," he adds. "We have applied this thinking to improve last-mile delivery services, reducing congestion in city centres and making e-commerce more environmentally friendly."

By accessing shared data, organisations can create new product lines or develop services that would not otherwise have been possible.

However, there are several barriers that organisations must overcome before they embark on their open innovation journey.

"Companies tend to silo their data. They really don't want to share it because they think they've got all the value," says Ingram. "The reality is they can't tap the value themselves because it's locked away." The insights must also be augmented from other sources to meet their full potential.

Trust and privacy concerns are key barriers to overcome when handling personal data or intellectual property. Existing and emerging technologies can enable responsible data sharing for a broad range of circumstances beyond banking, Howe says: "It makes sense this standard is being adopted in similar scenarios around the world as APIs are so widely used and understood."

Where privacy concerns are more acute, new privacy-enhancing technologies could allow partners to process data remotely without ever seeing the original data. This is especially significant in areas like medical research, where patient confidentiality is paramount. "The important takeaway is these approaches facilitate the sharing of data which may have been considered too high risk in certain settings," explains Howe.

Fear of competition can be another significant barrier to open innovation. For example, some companies fear that they will somehow be at a commercial disadvantage if they give data away.

"Companies with a particularly strong drive or vision will always win out, and if you have something that you know is unique, you should be confident in that," says Ingram. "Underpinning that will be layers of capability, and it's those capability layers which are the shared element. You're not open-sourcing your company IP but piggybacking on the shared capabilities of the collective. It gives you more opportunities than you would have potentially had before," he concludes.

One example of data collaboration in action is BCG Platinion's collaboration with Transport for London and Delivering London. The aim was to improve last-mile delivery services by reducing congestion in city centres and making e-commerce more environmentally friendly. By encouraging industries to share data through an ecosystem of partners striving for the same goals, that partnership can better design solutions and then work towards achieving them – in this case, by creating a more efficient delivery system.

With new initiatives often dependent on effective regulation driving change, compliance can also be a potential obstacle. To that end, the European Union has introduced the European Data Act, designed to make more data accessible while regulating who can access it and for what purposes. The UK is also pursuing a National Data Strategy to use data more effectively to boost productivity and create new jobs.

"There seems to be a shift towards applying the success of smart data initiatives like open banking to other industries. It'll be interesting to see where these go. Public awareness and consent around data sharing have to be a priority," says Howe. "In the UK, there is a discussion about what that might mean for how the NHS 'stewards' citizens' data, and how AI will be safely regulated in healthcare."

> **There's now a snowball effect with open banking as a blueprint for how data can be exchanged securely to facilitate innovation because we now know it works**

The result of this push for open innovation and data sharing initiatives is to create better products and services and extract better insights to make more informed decisions. But for this collaborative approach to data science to have a positive impact and drive societal change, ethical considerations are crucial.

"There is a slight tech utopianism to all this. It's naïve to assume that everyone is in it for the right reasons," says Howe. "That is why privacy and ethical concerns are hugely important. You only get fairer and better services if this is the top consideration. There's a big difference between what's legal and what's ethical, and so what's ethical will become a bigger part of the conversation in the future."

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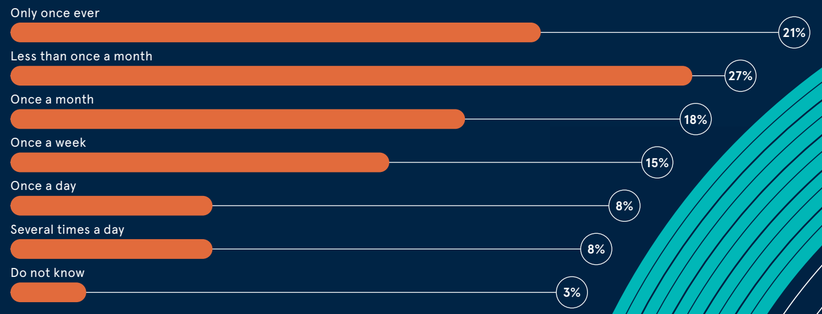
BCG PLATINION

NEARLY A THIRD OF BRITISH BUSINESSES ARE TARGETED AT LEAST ONCE A WEEK

Gov.uk, 2022

UK firms' responses when asked how often they experience a cyber attack on average



THE IMPACTS OF AN ATTACK

Gov.uk, 2022

Outcomes of cyber attacks / data security breaches most commonly cited by UK firms

- A We adopted new countermeasures to deal with any future attacks
- B We had to devote extra staff time to managing the problem
- C Employees were prevented by the breach from doing their daily work
- D The business incurred repair or recovery costs
- E The business was prevented from providing goods and services
- F The business suffered reputational damage
- G The business lost revenue and / or share value
- H We were discouraged from continuing
- I The business received complaints from customers
- J We issued goodwill compensation or discounts for customers
- K The business incurred fines and / or legal costs

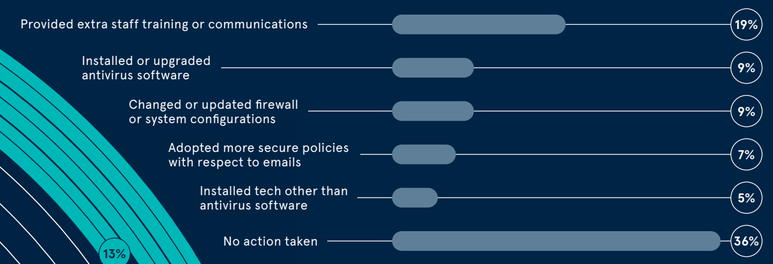
ALERT! CYBER ATTACKS IN THE UK

As the world accelerates towards fully fledged digitalisation, cyber attacks are becoming more frequent, sophisticated and effective. In the UK, roughly a third of organisations experience a cyber attack at least once a week, yet far too many fail to take appropriate protective measures in the aftermath. Although business decision-makers increasingly list cybersecurity among their highest priorities, most are still refining their ability to respond after an attack

ADEQUATE RESPONSES?

Gov.uk, 2022

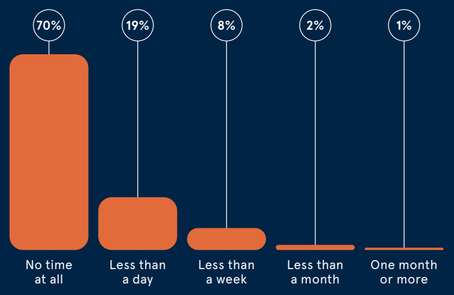
Key actions taken by UK firms since an attack or breach to protect themselves from future incidents



BOUNCING BACK AFTER AN ATTACK

Gov.uk, 2022

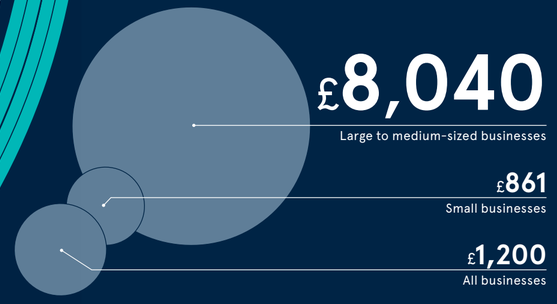
Time taken for UK firms to restore normal operations after identifying a disruptive attack or breach



THE COST OF A SECURITY BREACH

Gov.uk, 2022

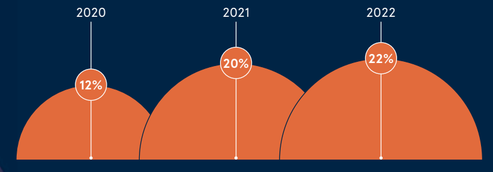
Average loss incurred by UK firms per incident



EXPENDITURE ON SECURITY IS INCREASING

Hiscox, 2022

Cybersecurity spending as a percentage of all IT spending among UK firms



FORECASTING

A crystal ball for businesses

Predictive analytics is becoming a valuable tool for companies seeking to model the probable outcomes of crucial decisions before committing themselves. But implementing the tech is easier said than done

Marianne Curphey

With stagflation increasing their costs and dampening demand for their goods and services, firms nationwide are busy cutting unnecessary spending and seeking new growth opportunities.

Determining where, when and how much to spend is always important, of course, but it's critical in a downturn, when such choices can have a huge impact on a business's medium-term growth prospects once the economy recovers. That's why, in search of ways to refine their investment decisions, companies are increasingly using predictive analytics to help them weigh up all the opportunities and threats.

"Risk management is never far from discussions among CFOs and regulatory teams," observes James Petter, vice-president and general manager at IT consultancy Pure Storage. "But, in the economic climate of 2023, every business leader will have risk management front of mind. They'll be making a deep assessment of the economics within their companies, their financial structures and technologies."

He continues: "Every company has a wealth of data and most are trying to do something with it. But often they're focused on understanding the current market conditions and reacting to these. I believe that there will be more of a push to look ahead as part of the overall focus on risk management. Predictive analytics will play a big part in this."

The rise of predictive analytics comes as no surprise to Shankar Balakrishnan, vice-president for northern Europe at software developer Anaplan. He likens companies that rely on historical data alone to navigate in such tough conditions to a driver steering their car according to what they can see in its rear-view mirror. Instead, Balakrishnan argues, they need access to more data sources to model potential future outcomes and so react more smartly to disruptive events.

> **Implementing predictive analytics isn't a case of 'run once and forget'. It will take time and effort to analyse and understand the findings**

Anaplan recently worked with the South Central Ambulance Service Foundation NHS Trust (SCAS), which covers Berkshire, Buckinghamshire, Hampshire and Oxfordshire, to help it develop a predictive capability. Applying machine learning and predictive insights to existing data, Anaplan was able to forecast the number of emergency calls that the SCAS ambulance teams were likely to receive at any given point. This has enabled the trust to deploy its resources more efficiently.

But what's the best way to implement this powerful AI-based technology? "For finance chiefs, the challenge is to understand where to focus," says Simon Edwards, CFO at software developer ServiceMax.

One good place to start, he suggests, might be automating functions in the back office. Using tech such as robotic process automation and AI-enabled data analytics not only helps to improve routine processes, cover skills gaps and increase efficiencies; it can also provide intel that can be fed into forecasting and planning. What's more, this kind of automation will also enable staff to focus on more value-adding tasks, he suggests.

Given that the commercial environment is awash in risk and uncertainty, few sensible leaders will want to trust important resourcing and investment decisions to gut instinct. Indeed, risk management may be the top priority in times of crisis, but what if business leaders could avoid the crisis in the first place?

Whether you're facing a pandemic, a flood or a ransomware attack, making effective choices under pressure calls for accurate and timely data-driven insights, says Alan Jacobson, chief analytics officer at data science company Alteryx.

"Successful risk management requires data as the course corrector, giving you the ability to model different scenarios," he says.

Jacobson points to travel and tourism as industries that are banking on predictive analytics to help them recover fully from the hugely damaging disruption they have suffered in recent years as a result of the Covid crisis. Aircraft manufacturers are using the technology to determine the most effective times to perform various maintenance tasks. Airlines are using similar systems to predict demand for particular services and plan their staffing and fuelling requirements accordingly to improve operational efficiency and minimise disruption.

"Quality data and predictive analytics are also integral to risk mitigation across the financial services industry," Jacobson adds. "They are invaluable for fraud detection, audit investigations and other types of advanced work."

Of course, the success of such efforts hinges on the standard of the data fed into the system. Insights based on faulty or incomplete inputs could mislead decision-makers and potentially cause significant harm to a business.

"Implementing predictive analytics isn't a case of 'run once and forget'," Petter says. "It takes time and effort to analyse the findings, understand them and tweak the program accordingly. The risk would be implementing a big program that doesn't give the required insights. It is important to have clear goals when implementing, adjust as needed and constantly refocus to ensure that the business is getting what it needs."

Indeed, numerous data problems can lurk beneath the surface, especially if users are inexperienced in handling the outputs generated.

> **If leaders are working with inaccurate data, they risk making inaccurate decisions**

This is a common risk that needs addressing. A failure to do so could cause material harm to a business, says Edwards, who adds: "Accuracy and compatibility are paramount when it comes to measuring performance across various departments."

Balakrishnan agrees. "If leaders are working with inaccurate data, they risk making inaccurate decisions," he says. "At the same time, if teams have to spend hours vetting and validating data, that makes it impossible for decision-makers to react at speed."

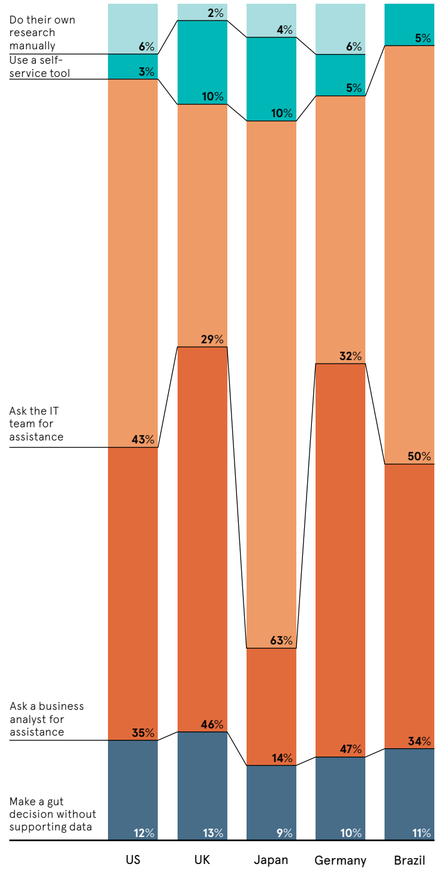
Despite the significant effort involved in getting predictive analytics up and running properly, the benefits are obvious to Petter.

"I don't think 2023 will be the year to leave any chink in your corporate armour," he says. "What predictive analytics enables is valuable to business leaders. With the insights it delivers, this technology has huge potential to turn data into gold."

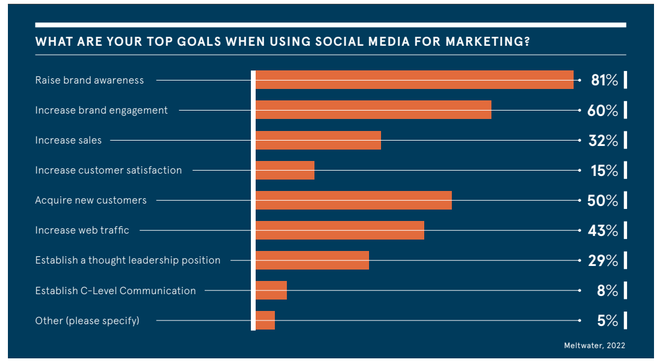
DECISION-MAKERS IN BRITISH FIRMS ARE MORE LIKELY THAN MOST TO MAKE BIG CALLS WITHOUT SUPPORTING DATA

Employers' responses to the question: "When people who are less data-literate in your firm have to make a business decision, how are they most likely to respond?"

MicroStrategy, 2020



Commercial feature



Businesses turn to social media listening for consumer insight

In a tight economy, social media offers businesses a value-for-money alternative to both customer satisfaction surveys and pricey ad campaigns

Social media platforms are a treasure trove of data about the behaviour, aspirations and wishes of the world's customers. But the way businesses listen in to and analyse this gigantic human conversation is changing, according to an international survey of 1,700 executives from medium to large businesses by media intelligence provider, Meltwater.

Nearly 63% said their main goal for social media listening was to gain a better understanding of audiences and target groups, compared to 42% who said managing brand reputation was a main goal. This is an extraordinary turnaround, says Samantha Monk, director of global enterprise solutions at Meltwater. "For much of the past decade, companies used social media to measure their brand reputation and discover what people were saying and writing about them on social platforms, uncover their sentiments towards them and see how these compared to their competitors. But today, social media has become a primary source of consumer insight," she says.

The sheer volume of social data available – and the increasingly sophisticated artificial intelligence and machine learning tools available to analyse that data – mean businesses no longer need to depend on focus groups, customer satisfaction surveys or online polls. By using social listening tools, they can find out what customers are saying spontaneously in their interactions with each other and discover what consumers truly care about.

This is inherently democratic, says Monk, as it gives customers a voice and a role that they have previously lacked. Rather than listening to a tiny sample of voices from a survey, the whole world can now contribute their viewpoints. "This is a fantastic way for companies to understand customers better," she adds.

With more than a decade of data from Twitter – and multiple years of data from Facebook, Instagram and Pinterest and TikTok, social listening tools have become invaluable for both consumer insights and predictive analytics, she says.

And that's not the only application. Predictive analytics uses past consumer behaviour to forecast how certain actions by a company are likely to impact its sales and profits. Meltwater, which offers media listening services in 120 countries, helps businesses predict how consumers will react to their marketing campaigns and products.

For instance, Monk explains that Meltwater is able to score companies against their competitor set to help them understand how they are perceived when it comes to ESG criteria like environmental impact and labour relations. Using advanced modelling and historical data, Meltwater can then make predictions for how much revenue would increase if they improved their reputation in different areas consumers care about. "Businesses have always known that communications matters – and now we are able to quantify it," says Monk.

At the same time, Meltwater's social listening technology can provide deep insights into how people consume products. For example, it can analyse social media posts to see when people talk about going out for a hamburger, based on every time they post a selfie eating a burger or join a conversation about burgers. This helps to uncover huge amounts of information about consumer behaviour – such as the different times of day and occasions for eating fast food, who consumers share the experience with and how they react. This type of data helps businesses to plan powerful marketing campaigns and target different audiences. And the data comes direct from the horse's mouth, dispensing with the need for complicated market research programmes.

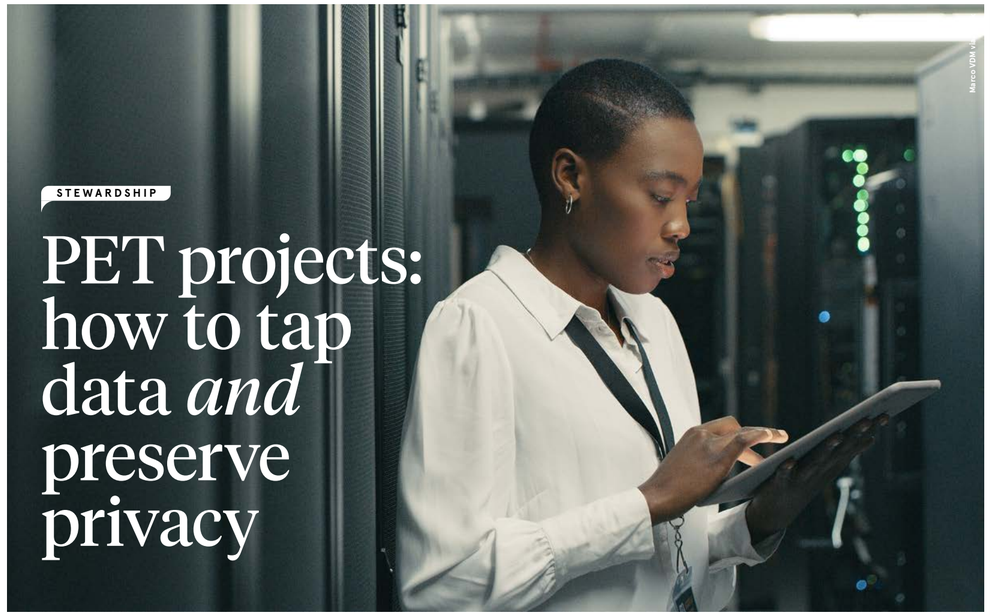
Thankfully, many companies are now getting the message that social media is an indispensable business tool. Some 42% of executives in the Meltwater survey said that they were planning to increase their social media marketing budget next year, while 34% said they would maintain it at this year's level.

Social media used to be seen as a bit of fun – and one of the first things businesses could cut in a recession. But as economic pressures mount, businesses are beginning to understand that social media allows them to promote messages, uncover consumer insights and create predictive analytics, while still offering excellent value for money. Nearly 52% of respondents said the challenging economic situation had made social media more important for their organisations.

Even so, the survey found that nearly 45% of organisations have no social listening programme. That means they have little insight into their brand's contribution to the world's biggest conversation. As Monk says: "No business can afford to ignore this crucial area of insight and understanding."

For more information please visit meltwater.com

Meltwater



STEWARDSHIP

PET projects: how to tap data *and* preserve privacy

Regulatory compliance and customer retention depend on the proper stewardship of data. That's why businesses are turning to privacy-enhancing tech to meet their obligations and stay ahead of the pack

Kate O'Flaherty

Privacy is a key regulatory and consumer demand, but it presents a challenge for businesses: how do they balance their duty of compliance with the need to make the most of the customer data they collect?

Enter privacy-enhancing technologies (PETs) – the solution to protecting this data while still enabling users to extract the insights they require from it.

PETs are designed to protect personal data while ensuring that it can be used for analytics or advertising. Examples include homomorphic encryption, which enables firms to analyse or manipulate data using complex mathematical operations without decrypting it. Secure multi-party computation lets several entities collaborate without viewing each other's data. And, lastly, a trusted execution environment isolates the data from the computer's main processor to ensure that it remains protected.

It's still early days for these technologies, but big-tech players such as Apple, Google and Meta have recognised their potential. For example, during the depths of the Covid crisis, Google and Apple demonstrated how PETs could be used in privacy-preserving contact tracing. Facebook, meanwhile, has applied a combination of PETs to advertising metrics without compromising the privacy of users.

So why are the giants so keen on PETs? Among their benefits, these technologies help businesses to avoid falling foul of data protection regulations by proving that they "protect personal data by design and default", says Camilla Winlo, head of data privacy at professional services consultancy Gemserv.

There are also strong commercial reasons to consider PETs, she adds. "If a business is seen as being unable to protect data in line with modern standards, there is a very real risk that it will lose sales."

PETs can help to minimise the huge volume of data an organisation processes. This can have "other positive effects", according to Luke Dixon, partner and head of data and information at law firm Freeths. "PETs help businesses to balance their need to share and analyse personal data against the privacy rights of individuals. They can also enable companies to give access to data sets that might otherwise be too sensitive to disclose."

PETs are being adopted in a range of sectors. They're gaining considerable traction in financial services, where companies are using them for anti-money-laundering checks, Dixon reports. They're also finding favour in public healthcare, where organisations are sharing patient data privately between teams.

But PETs have yet to enter the mainstream. These technologies are being adopted either by large organisations or by specialists with a strong privacy focus, Winlo says. She points to the Brave web browser, which incorporates PETs to prevent users from being tracked online.

Another business that's adopted PETs is Flo, a period tracker app. This has recently added an anonymous mode based on PETs to protect users' reproductive health data in light of the recent *Roe v Wade* ruling on abortion rights in the US. The new feature was offered as an option to the app's 48 million active monthly users in September.

Flo's PET-based system decouples health data from personal data. The anonymous mode account contains no unique user identifiers such as email addresses and Google or Apple account IDs. The material transferred from the initial account is limited to health data, reminders and the user's reason for using Flo.

The benefits are clear, but Winlo stresses that PETs are still new and must be implemented with care.

"Organisations need to ensure that they understand the risk the PETs are designed to address, the outcomes they want to achieve and the likely consequences of using PETs," she says. "It is really important to test them thoroughly."

Using PETs can result in changes that may come as a surprise, warns Winlo, who adds: "Some users may lose access to data, or they may become aware that statistical techniques have been applied and lose confidence in it."

It's therefore a good idea to explain to users what the tech does and then involve them in development conversations, so that any affected processes can be updated.

Dixon would advise any organisation seeking to adopt a PET to perform a data protection impact assessment first. As part of this, it would need to consider and document the purpose and scope of the data processing activity where it intends to implement the tech.

"Your organisation should also check to ensure that the PET is mature enough for its purposes," he says. "You don't need to use the latest technology out there, but you should consider the PET in the context of what's state of the art."

A lack of standardisation makes PETs prone to design flaws, warns Cezary Cerekwicki, head of product security at browser maker Opera. But, with tech companies such as Google working to make existing theoretical solutions available on the market, the future looks "very promising", he adds.

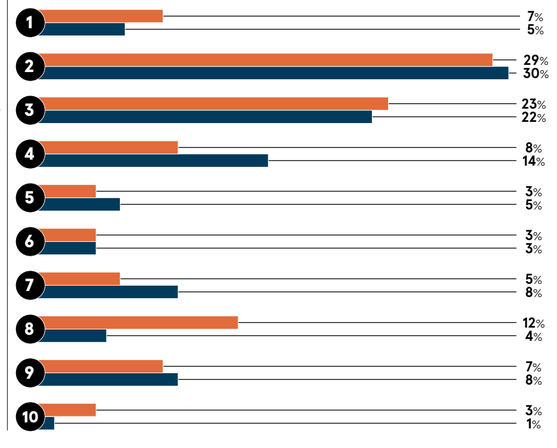
As these technologies develop, Winlo expects PETs to become better known over time, with some becoming standard tools for certain processes. But she concedes that "we are some way off that point at the moment".

For now, it's important to realise that PETs aren't a perfect solution – not yet, at least. These technologies have the potential to help businesses balance their use of data with protecting privacy, but it's unclear how popular they will really become, according to Dixon.

"PETs' success relies partly on the development of industry-led governance," he says. "This will help to inform organisations how to use them responsibly and let developers know how to build them in a way that best serves users' needs." ●

CHIEF DATA OFFICERS BROADLY TRUST THEIR PETS

CDOs' responses to the question: "How concerned are you about your PET on a scale of one to 10?"



> If a business is seen as being unable to protect data in line with modern standards, there is a very real risk that it will lose sales

Commercial feature

The pillars of resilient data strategy

Building a solid data strategy will be central to the health of businesses throughout the oncoming recession. Could open technology initiatives be the key to recovery?

The current economic climate has left businesses worried about their resilience. Increasingly, companies are ramping up their spend on digitisation and modernization initiatives to boost agility across their business operations and hone their disruption response planning.

Gartner's latest research estimates that annual global IT spending will hit $4.5 trillion by the end of 2022, a 3% increase on 2021's figures. Global uncertainties and talent shortages have accelerated CIO purchasing decisions, from ownership to services – pushing cloud spending to 22% growth in 2022. This bump indicates that organizations aren't slowing their modernisation efforts. Moving to the cloud will play a critical part in helping navigate the oncoming economic downturn.

"Data is the connective tissue between business and technology," says Dael Williamson, chief technology officer for EMEA at Databricks. A robust cloud data architecture will be essential for strategic and operational decision-making across enterprises, particularly in the current climate.

However, Databricks research finds that just 13% of businesses are successfully executing a data strategy. Williamson suggests businesses that haven't implemented a modern data strategy are more likely to take a reactive approach to disruption. "You can see indicators of businesses that haven't [developed a data strategy] because they're bringing in cost-cutting measures," says Williamson. "When you have data silos, you don't have a 360-degree view of your business. This slows organizations down and keeps them from being agile and making accurate business decisions, which is leading to layoffs," he says.

Data-driven decision-making will help businesses maintain momentum and build resilience through turbulent times. Williamson continues: "Some of our most mature customers are not slowing down. They're focused more on optimising, keeping things in check."

A clear-cut data strategy plays a significant role in a company's ability to mitigate risks and respond to uncertainty. While most businesses will use their own structured historical financial data to model future performance, insights from new unstructured data sources like machine, web, mobile and third-party data should not be overlooked. They will need to go beyond traditional data strategies to establish a comprehensive view of the risks and opportunities that lie ahead.

Williamson suggests that implementing modern data architectures, or 'data lakehouse architectures', unifies both the structured historical data and the unstructured machine data onto a single platform where more complete data-driven decisions can be made.

Williamson cites the Financial Times' prediction of Chile's largely unforeseen banking crisis as an example of casting the net wider to better understand market trends and get ahead of disruptions. "They looked at alternative data sources," says Williamson. "You can almost A/B test your risk, which is a fascinating way of thinking about it."

There are a number of questions decision-makers can pose to analyse and forecast trends. "What's the market telling me versus my historical data? And when I look at the two together, which one's going to be the more accurate indicator? Am I in unprecedented times where there's extreme uncertainty, or are we running business as usual? But to do that, you need to have a unified view of your data. That's where a modern data strategy comes in," says Williamson.

These questions can then form the basis of scenario-planning exercises, where organisations can track and model different internal and external factors to create a strategy and make real-time decisions. "You've got this cascade of data with these predictive capabilities. It will say: here are three or four options you could take. It's not telling you what to do, but a more accurate choice can be made," Williamson explains.

Forging a path to recovery will require businesses to think laterally. To create a strategy that accounts for myriad factors, both structured and unstructured data will help decision-makers to run simulations that provide a holistic outlook on the state of the market.

This practice is already commonplace in highly regulated industries such as banking and other financial services, where risk exposure is tracked minutely. But the principles that guide highly risk-averse industries can be applied across all sectors to great effect.

"It's helpful to learn from those that are being forced to be more risk-conscious and borrow their processes," says Williamson. In doing so, leaders can gather a clear picture of what a bullish recovery might look like and the pathways that could lead them there.

First, it's essential to keep the desired outcome top of mind. This will allow the business to prioritise the most important data sets. From there, they can work towards a set of adjustable goals based on different factors to profile various outcomes. Williamson advises: "Work backwards from what you want to do. You might not know the exact answer, but you know you're choosing a recovery strategy. How do you get there?"

Williamson extols the virtues of open and governed technologies. "Transparency creates audit trails which creates greater trust. That lineage of what's happening with the data and what led to the outcome creates trust," he explains.

Crucially, this has to be done quickly. The more time companies take to parse and analyse data, the more risk the business takes on. Investing in simple, open, multi-cloud data tools that remove the complexity of these tasks will be vital to supporting a coherent and agile data strategy.

Collecting and analysing data in this way allows businesses to leverage artificial intelligence (AI) to manage risk and even identify possible exposures that would have previously been undetectable. There is scope for companies to use AI more proactively. Williamson references supply chain management and hiring as examples of well-established processes that can be made more efficient through predictive modelling.

For businesses that are growing or consolidating, these efficiencies could prove transformative. "By reducing margin, you create or increase revenue. You can use AI proactively to create efficiencies," says Williamson. "That doesn't necessarily mean that it's just taking jobs or it's unsupervised … It will help people to do better jobs rather than menial jobs."

Forming data-led and AI-supported business strategies will give scaling companies a crucial point of distinction from other players in their space. In addition, a better understanding of insights and their uses can reduce lead times and help organisations identify solutions for their customers and their operations.

While most data teams operate in silos within their organisations, those that embrace simple, open cloud technologies will be able to expand their capabilities and create value across the entire enterprise.

> Data is the connective tissue between business and technology

For more information, visit databricks.com/learn/executive-insights

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Transforming data into value

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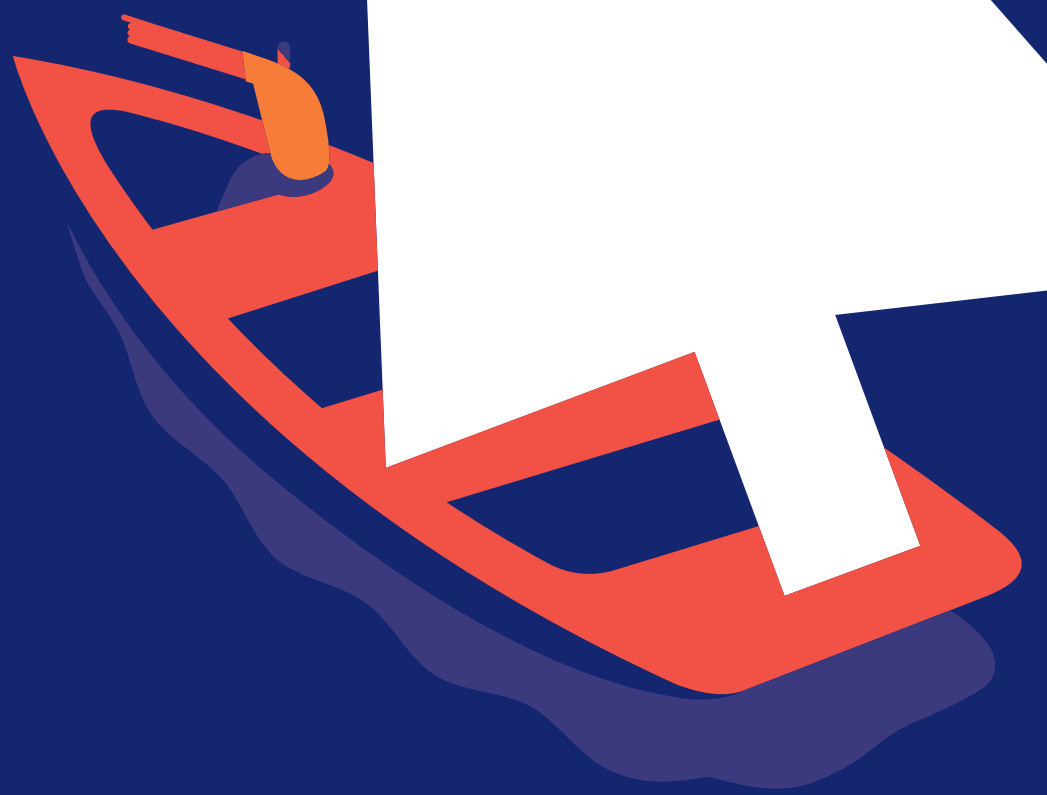

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