The evolution of data

Unlocking the potential of data to transform our world

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Foreword

Prior to the COVID-19 pandemic, the digitalisation of businesses was already widespread and gaining pace, with rapid developments in technology enabling innovation across sectors. The pandemic has accelerated this trend, leading to a dizzying pace of change. For businesses looking to keep that pace, the use of data and analytics will be a key enabler, helping to enhance the customer experience, find solutions to intractable problems and make better business decisions. But a fundamental mindset shift is needed if we are to achieve the enormous potential of data.

As we observed in our previous whitepaper[1], the COVID-19 pandemic has challenged economies, altered consumer behaviour, and forced businesses to adapt the way they work. Changes that previously took years to enact were implemented within days and weeks, particularly when the first national lockdowns were announced.

The explosion in online retail is one such example. In the UK, the sector experienced four years' growth in the 12 months to July 2021, with its share of total retail spend rising to over 34%[2]. By 2025, we estimate that online retail sales will have reached levels not previously expected until 2035 – that is a full decade of digital acceleration.

[1] https://www.experian.co.uk/blogs/latest-thinking/data-quality/the-data-debate-a-forward-view-of-key-trends-for-2021-and-beyond/

[2] https://www.experianplc.com/media/latest-news/2021/covid-19-turbo-charges-britain-s-digital-transformation/

Today, we have reached a point where the stars are aligning in terms of dramatic increases in data processing power; artificial intelligence (AI), including machine learning (ML); and a willingness by businesses to deploy this technological power to enhance the customer experience.

As writer, technologist, and author Azeem Azhar notes, we have entered an exponential age.[3] Ours is the first era in human history during which technology is constantly accelerating while the price per unit drops. And although this presents some extremely exciting possibilities, it also raises some questions:

- **How can businesses prepare themselves?**
- **Do businesses have the necessary data skills?**
- **Do businesses have the right frameworks to use customer data appropriately?**
- **How can businesses build trust with customers?**
- **How can regulation enable innovation?**

Although 'digitalisation' is the word on everyone's lips, many businesses and policymakers have only just set out on the journey. With ML and AI, we are on the brink of a transformative change in our society, similar in scale to the introduction of electricity. With that in mind, businesses need to be supported in unlocking the potential of data to help them make more efficient and effective business decisions, create better digital journeys for customers, and grow revenues. The UK's National Data Strategy[4] (NDS) is an encouraging first step, but the scale of the challenge ahead is clear:

The NDS lays out a clear vision of digital Britain. But to achieve this, our society needs to develop a better understanding of data, its role in building the economy of the future, and the benefits to society as a whole.

Jonathan Westley
Chief Data Officer
Experian UK&I and EMEA

[3] https://www.exponential-book.com/

[4] https://www.gov.uk/guidance/national-data-strategy

There are currently up to

234,000

vacancies for data roles

in the UK – finding people with the right skills is difficult.

Small and medium-sized businesses are

lagging in digital transformation.

Some organisations

struggle to balance

encouraging innovation and complying with regulation.

Introduction

Over two very challenging years, technology has proven an essential tool in tackling the disruption of the pandemic, demonstrating the astonishing power of human ingenuity. Some of the changes and innovations brought about by the COVID crisis were already in train but arrived more quickly than expected, while some have been unexpectedly beneficial. Regardless, it's clear that many of the changes are here to stay and that our businesses, institutions and society generally will not look the same as they did at the beginning of 2020.

Looking ahead, we expect this digital transformation to continue to gain pace. Those that are ready for the shift will be best placed to benefit from the fundamental forces reshaping our society. And being ready means being ready to manage, analyse and understand the huge amounts of data created by a digital society.

The UK government has shared its vision of Britain as a world-leading digital economy. But our ability to rise to this ambition will depend on our ability to use data to innovate, experiment and drive growth. This paper discusses the roadblocks on the path to becoming a data-enabled society and explores the fundamental mindset shifts needed to ready our society, businesses and workforce to harness the enormous potential of data.

Enabling better business decisions

Data is already helping to solve some of the problems that we face today and better preparing us for those we will face in the future. It is impossible to predict the many ways that technology, and the data it helps us analyse, will improve our society and grow our economy. So when we talk of the 'data opportunity,' what do we mean?

The analogy of a three-legged stool is helpful, with technology, analytics, and data each forming a leg. Both technology and analytics have seen incredible advances in recent years – high-powered processing and cloud computing are game changers for technology, while AI is opening up new possibilities in terms of analytics. But these two 'legs' rely on access to high-quality data. If one leg fails, the stool falls over. So if data doesn't advance as quickly as the others, we won't be able to capture all the potential benefits of the advances in technology and analytics.

Most businesses already collect data in some way, but they may not yet recognise the value of that data or hold it in formats that allow them to analyse it properly. Because just having the data is not enough. It must be able to be classified, analysed, and processed to produce real insight. It's this insight and increased understanding of customers and opportunities that will lead to better decision making.

The use of AI will dramatically increase the possible applications of data. Javier Campos, General Manager, Experian DataLabs, likens AI to the introduction of electricity. "Whereas electricity changed society by decentralising power away from coal mines, AI will transform society by distributing throughout every part of an organisation." Businesses will be able to analyse and understand huge quantities of data at speeds never seen before. With the right inputs, AI algorithms can make better decisions than humans, spot patterns that we can't, and join up dots we haven't yet. However, there are some challenges to consider.

> "Whereas electricity changed society by decentralising power away from coal mines, AI will transform society by distributing decision-making throughout every part of an organisation."
>
> **Javier Campos,** General Manager, Experian DataLabs UK&I

1 Data quality is crucial but difficult

Poor quality data has the potential to introduce bias into AI and compromise the accuracy of any insights generated. It is important to remember that the machine is only going to learn and create insights based on the data provided as an input. Logically, poor inputs lead to poor outputs and poor outcomes. But the task of 'cleaning' disparate data sets to create a cohesive whole can be difficult work.

The "simple" challenge of standardisation

Even simple variations can cause big headaches when it comes to processing data. At Experian, we recently deployed ML to augment customer home addresses so we could better match data to individuals.

One of the challenges we had to overcome was people using different home address formats or including a house name, e.g. Highcroft or Irongate. While this delightful individuality is a core human trait, the inadvertent variation can cause all sorts of chaos when processing large sets of data.

2 Access to data

Businesses rely on customers giving them access to and permission to use their data. However, many customers do not understand why their data is needed and how it is being used, making them reluctant to share personal information. This is hampering organisations' ability to build better products and services based on data-driven insights.

3 The skills to manage data

Many UK businesses are not aware of the level of data literacy within their organisations or whether they have the data skills they need to achieve their digital transformation ambitions. Or, they may have a wealth of data in misaligned formats, limiting the value they can extract from it.

Setting out on the data journey

To tackle some of these hurdles, the UK government's NDS sets out a framework to make data more usable, accessible and available across the UK economy while protecting people's privacy and ensuring the responsible use of data. It's a helpful starting point for fostering innovation and giving businesses confidence to capture insight from data within the rules.

But businesses will need strong data foundations in place if they are to realise the enormous potential of the advances in technology and analytics. Appointing a Chief Digital Officer (CDO) is often a good place to start. Researchers have found[5] that businesses with a CDO are twice as likely to have a clear digital strategy as those without. The next step is conducting an audit of data literacy and assets to understand where additional resources or leadership focus might be needed to address any gaps.

[5] https://assets.kpmg/content/dam/kpmg/xx/pdf/2018/06/cio-survey-2018-executive-summary.pdf

Identifying opportunities to use data

One of the challenges that all businesses face is in knowing where the next risk of disruption will come from. This vulnerability will be particularly acute for businesses that underestimate the range of applications for ML and AI within their field. Digital transformation projects can tend to focus on enhancing an existing business model. However, businesses could be caught flatfooted by unexpected challengers if their digital strategy focuses too much on themselves and not enough on how they can serve customers better.

The growth in buy now pay later (BNPL) providers is an example of this type of disruption. Although the ability to buy now and pay later has long been provided by credit cards and individual retailers, modern BNPL providers have created a frictionless experience that targets customers at the critical moment in the customer journey to offer them flexibility in payment terms. By adapting their service to the new reality of online retail experiences, BNPL providers have been able to disrupt the 'pay later' model already offered by credit card providers.

Setting expectations

Businesses can be reluctant to explore new applications for data, like AI, if there are unrealistic expectations around how it will perform. For example, self-driving cars are expected to be a lot safer than human drivers, but because of a lack of understanding about how AI and ML work, some people expect them to be perfect. Their performance is measured by every mistake they make, rather than the lives they could save in comparison to human drivers.

In financial services, we can already show that AI does a much better job at determining credit risk than humans. Experian has shown that applying ML in credit decisioning achieved a 25% reduction in bad debt.[6] It also has the additional benefit of removing the unconscious bias that can plague human decision making. To help businesses understand the benefits of these applications, data teams should highlight comparison points that demonstrate their effectiveness compared to the status quo or alternative solutions, and not aim for perfection immediately.

[6] https://www.experian.co.uk/content/dam/marketing/uki/uk/en/pdf/experian-machine-learning-decisioning-report.pdf

Husky or Wolf? Learning the right things from data

Classification is one of the core use cases for ML. But if humans have not classified the input data correctly, the machine can learn the wrong things.

As an example of this, a team from the University of Washington created an AI to spot the difference between a husky and a wolf in images.[7]

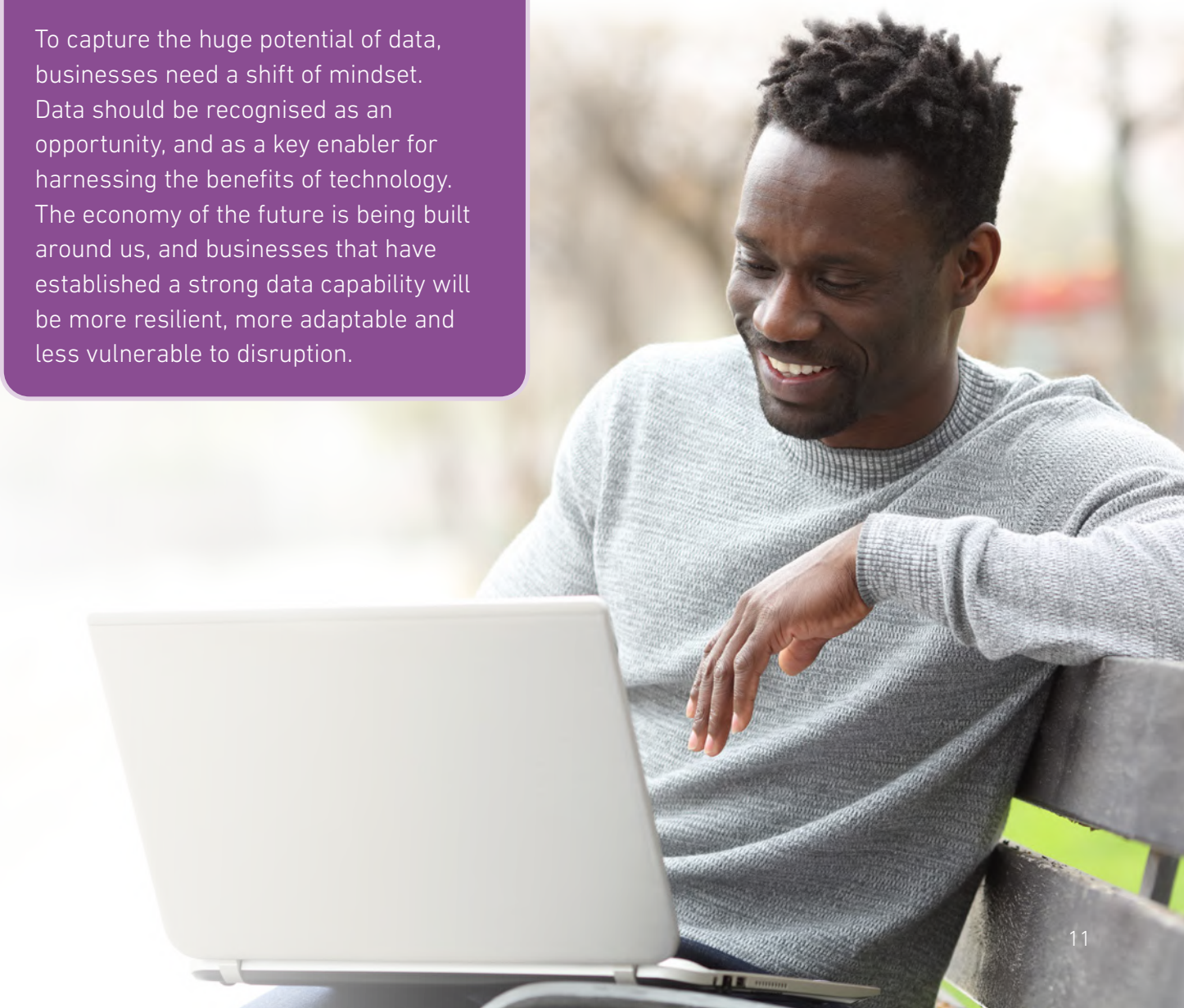
After initial success, the team realised the algorithm had learned to base its decision on the background in the image. If it detected snow, it predicted "wolf", and if not, it predicted "husky".

By only including images of wolves in snow in the set of images used to 'train' the system, the researchers had inadvertently skewed the results, demonstrating that AI is only as good as the data that feeds it.

[7] https://arxiv.org/pdf/1602.04938.pdf

Summary
Key takeaways

To capture the huge potential of data, businesses need a shift of mindset. Data should be recognised as an opportunity, and as a key enabler for harnessing the benefits of technology. The economy of the future is being built around us, and businesses that have established a strong data capability will be more resilient, more adaptable and less vulnerable to disruption.



Building customer trust

A key part of building trust with customers over their personal data is establishing rigorous frameworks around how it is managed and used. According to Clinton Hook, Director of Data Governance for Experian, good data governance starts with being clear about what an organisation is trying to achieve. “It should be outcome based – what are you trying to use the data for and are you being transparent about that? And if you’re trying to achieve something that is for the good of society, for the good of your customers, then great.”

The effectiveness of AI solutions will depend on data quality, accessibility to data, and the right frameworks around managing data. Sloppy engineering could cause damage, and potentially lead to the introduction of bias and the creation of unfair models. And sloppy data management could lead to the same outcomes. So as businesses explore the potential applications of AI, it’s just as important that they pay attention to their data frameworks to ensure fairness and rigorous governance.

1 | Explain clearly

Seeking consent and letting customers know what their data is being used for is already mandatory, but many companies rely on procedural and complex language to explain their data management processes. Using simple language to explain clearly why data is being collected feels more authentic and can be more persuasive. A polite and honest explanation can inspire more trust, even when the data is being collected for marketing purposes.

2 | Demonstrate the benefits

Even better, companies could demonstrate the benefit of their data collection by creating truly personalised and seamless customer experiences. As Jon Westley, Chief Data Officer of Experian, explains, "Any digital journey worth its salt is personalised." Yet, too often, even large multinational companies' data processes are not joined up enough to know that they don't need to serve you ten more lawnmower ads today because you bought one from them last week. For these companies, the challenge isn't access to data, it's about using it cohesively to provide a smoother, better digital experience.

3 | Make it easy to manage

Most people care about how their data is used, and they want to know that the organisations they share data with are using it responsibly. GDPR regulations guarantee that individuals retain rights over their personal data, but companies can emphasise their responsibility by making it simple and easy for individuals to manage their data. It signals a genuine commitment to transparency and a willingness to be held to account for how data is used.

Summary
Key takeaways

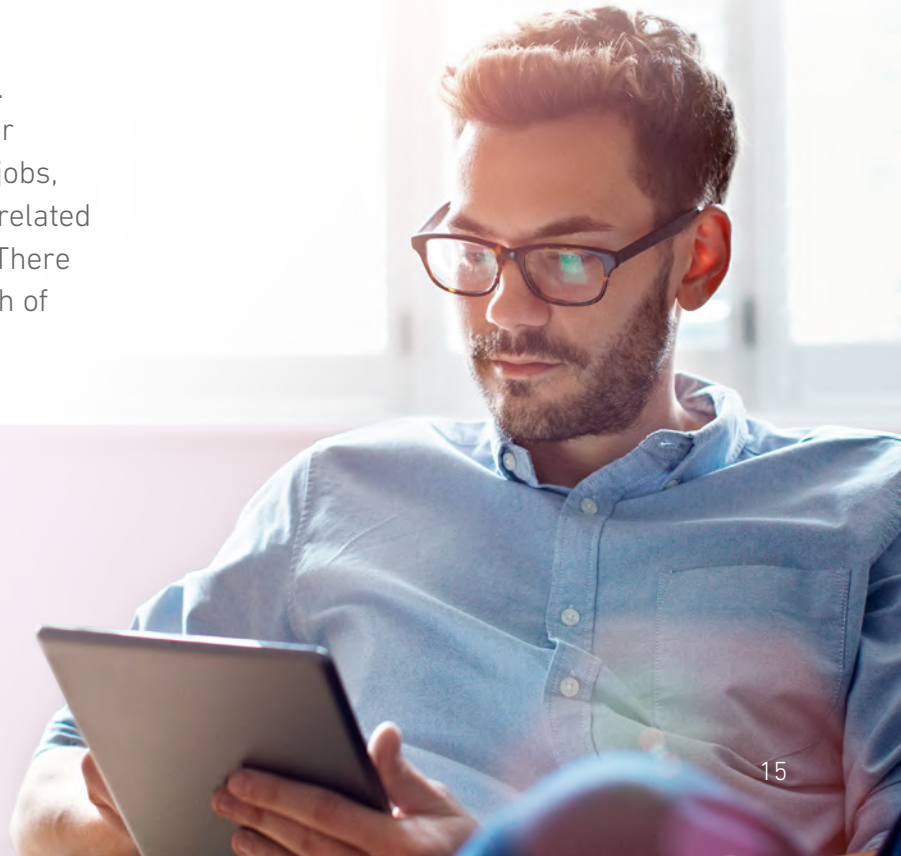
Customers are willing to share their data when the benefits of doing so are clear, but they want to know their data is being used responsibly. By highlighting the benefits of data and analytics, companies can help consumers understand the opportunities and embrace the positive potential of data. This mindset shift will help customers reap the many benefits of a digital society without relinquishing their rights.

Training a digital workforce

At present, there are 234,000 vacancies for data roles in the UK, and despite the clear demand for the skills and many attractive opportunities in the field, the skills gap is still growing. In 2021, the UK government published a data skills audit which sought to map out the state of UK data skills. The study confirmed what companies had been reporting anecdotally for years: data roles are incredibly hard to fill due to the limited pool of data-trained candidates and the high cost of attracting the right ones.

Understanding why

In response to the study, Experian commissioned further research that revealed many students are not pursuing a career in data due to key misconceptions they have about the industry. 68% believe you need qualifications in maths or science to succeed in a data role, while 72% believe you need specific data skills to apply for a data-related job. Our research also highlighted that gender plays a role in the uncertainty over data jobs, with men more likely to consider a data-related field (60% compared to 48% of women). There is also a lack of awareness of the breadth of roles available within the field.



Working in data

68% believe you need qualifications in maths or science

72% believe you need specific data skills to apply

However, in the digital economy of the future, the majority of roles will involve data. Rather than seeing it as a specialist skill that few have, we need to shift our mindsets to seeing it as a foundational skill. This does not mean that everyone must become a data scientist or a coder. In fact, there are many data roles that do not necessarily require advanced data analytics qualifications, including data security and governance, data processors and data engineers. Even AI solutions can now be created via AI tools for non-coders.

> “In the digital economy of the future, the majority of roles will involve data.”

Casting our net more widely

To tackle the widening skills gap, government, businesses and educational facilities will need to cooperate and engage to understand how the needs of business and their products translate into educational opportunities.

The government’s skills audit showed that the supply of data scientists graduating each year from UK universities is unlikely to be more than 10,000 (based on 2017-2018 data). So although more data science courses are being offered every year, the pipeline of new graduates is significantly below the current demand, let alone the growing demand in the future. It’s clear that relying on university-trained candidates will not be sufficient to plug the gap.

To widen the candidate pool and ignite students’ interest in data, we need to combat the outdated perception of data roles as ‘boring’ – many cutting-edge brands, like Google and Tesla, are based on innovative use of data. We also need to consider how to broaden the appeal of data roles to entice students from a wide range of backgrounds and offer them a range of career paths. Universities should no longer be seen as the sole source of all data candidates.

Summary
Key takeaways

The economy of the future will be built around technology and data, so boosting data skills across all sectors will be essential. This requires the government, businesses, and the education sector to work alongside each other to challenge the misconceptions around data careers.

We also need to challenge the mindset that only data scientists can have careers in data. Actually, the field offers a range of rewarding roles that can be accessed by a range of training options and career paths. Looking ahead, we will all need to become more data literate to succeed in increasingly ‘data-rich’ environments.

Exploring the potential for neurodiversity in Tech

Research has repeatedly shown that neurodiverse people can be extremely successful and valuable in STEM fields – Elon Musk, Steve Jobs and Bill Gates are good examples. However, conventional recruitment practices, like chemistry interviews to determine 'cultural fit' can disadvantage neurodiverse people.

A report[8] by the Scottish government delved into the role that neurodiverse people can play in the data industry and identified a range of key skills associated with neurodiverse conditions that align with the skills the tech employers are looking for.

By promoting employment opportunities to neurodiverse people and adjusting their recruitment processes to be more inclusive, employers can tap into a wider pool of talent. They can also contribute to tackling the unemployment and underemployment of neurodiverse people in our society.

Organisations such as EY are paving the way, with the announcement of its first Neurodiverse Centre of Excellence in the UK, based in Manchester, recruiting up to 100 neurodivergent individuals over the next 3 years.[9]

[8] https://www.skillsdevelopmentscotland.co.uk/media/47066/neurodiversity-in-digital-technology-summary-report.pdf
[9] https://www.ey.com/en_uk/news/2022-press-releases/01/ey-selects-manchester-to-launch-its-first-neuro-diverse-centre-of-excellence-in-the-uk

Conclusion: Enabling innovation

The extensive use of data, in ways we haven't even imagined yet, will be a standard part of life for future generations, who will grow up knowing no different. But we are only beginning to see the transformative potential of AI and high-powered processing. When you consider the number of different processes across different industries that exist, it's clear that the possible applications of AI are almost limitless.

In the digital age, the organisations that will succeed are those that understand the role of data in harnessing the full potential of technology. And they will have already laid the foundations for data innovation by investing resources and energy into identifying data opportunities. The steps we take to prepare now will determine who wins, and loses, in the hyper-digital society of the future.

The National Data Strategy is a starting point, but businesses and organisations will need to move quickly to build a data advantage and keep pace with technology. Government has a vital role to play in supporting readiness for the digital economy and enabling innovation. This means providing clear guardrails to ensure data is used appropriately while balancing the need for freedom to innovate.

We are hurtling towards a bright future with data and digitalisation at the centre of our society. And to meet that future head on, we need to change the way we think about data as businesses, consumers and candidates, and embrace the opportunities it brings.

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