AI and Data Analytics

A SWOT analysis and where next for the region in this space

Centre for the New Midlands

Contents

Introduction

Analytics and Data underpin all digital technologies – enabling us to gain insight and make decisions that will have a material impact on our business strategies. The ongoing trend for digitization, the use of technology to evolve or even change how organisations run their businesses with the aim improving the value generated.

Cloud technology has become ubiquitous and has reduced the barriers to adoption of solutions that were previously limited to larger enterprises with deep pockets. The opportunity is now here for anyone to start making use of their data to begin to seek new value.

Whilst data is the bedrock of innovation, it is not useful on its own. Value comes from how one uses the data collected to make better decisions and eventually create more innovative products and services[1].

So what could this really mean for businesses in the Midlands?

Mckinsey[2] suggest digital initiatives have the potential to create value equivalent to efficiency improvements of 15 to 20 percent across organisations.

Given the UK is, at the last estimate, around 15% less productive than the average member of the G7, digitization and the utilization of data across businesses has the potential to bring material improvements to the economy of the region and the wider country.

It well understood that data can be used to create value for businesses. **But the struggle to realise that value often starts with two simple questions: "what do I need to know?" and "where do I start?".**

This analysis aims to help in creating that starting position, outlining some of those key questions and associated factors from the perspective of our region.

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[1] [Drive Your Business Forward with Data (kagool.com)](kagool.com)
[2] [Industry 4.0 demystified--lean's next level | McKinsey](mckinsey)

Strengths

1. **Build on the existing manufacturing base**

   The Midlands already has a strong manufacturing base which will benefit from making better use of data and AI through Industrial Digital Technology (IDT). A recent government report analysing the UK's regional ecosystems[3] says:

   > *This region continues to perform strongly relative to the UK in manufacturing, constituting 15% of the West Midland's total GVA output (location quotient 1.6 compared to the UK), with specialisms in Metal Products, Electrics, and Automotive. The Services sector contributes 74% of total GVA with the Real Estate, Retail, Health, and Education sectors providing large proportions of the region's total GVA[4].*

2. **Our experts already know where the problems are**

   The advanced manufacturing expertise in the region has lots of potential practical use-cases for these kind of initiatives to have a material impact if the right support structure is provided ~ a key criteria for success in these types of programme tends to be embedding data & analytics work in a business context. Keeping the outcomes front of mind helps to frame why one is completing a Data and Analytics (D&A) initiative.

3. **We have the educational infrastructure to succeed**

   A cluster of high-quality tertiary education institutions producing well rounded graduates for the regional workforce ~ Warwick, Coventry and Birmingham and Aston Universities to name the key players.

4. **We have easy access to the whole country**

   Central location in the country – the Midlands is easy to get to! Rail and Air-links to both the East and West Midlands make it an accessible part of the country. If the levelling up agenda of the current UK government improves infrastructure – that will only help the situation.

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[3] Department for Digital, Culture, Media & Sport: Assessing the UK's Regional Digital Ecosystems (publishing.service.gov.uk)
[4] Gross Value Added - a measure of the value of goods and services produced in an area, industry or sector of an economy. It is calculated as the value of outputs minus the value of intermediate consumption

5. London is not the whole world

The Midlands is clearly not London. Quality of life and cost of living is a key to attracting the right talent to enable Data & IDT initiatives; but it's only part of the story given the shift to more hybrid and remote working (see threats).

6. We are becoming a 'multi-centre' digital region

The region is rapidly becoming 'multi-centre' in its distribution of the digital economy. While the focus in on Birmingham, the other centres in Coventry, Warwick, Leamington Spa and Worcester are also developing. This is beginning to provide for a digitally aware and data literate workforce that will permeate the region as a whole. The success in attracting large digital employers[5] is also supporting this; for instance Codemasters, HSBC, Goldman Sachs, Deutsche Bank and Lombard Risk have all established bases in the region.

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[5] Department for Digital, Culture, Media & Sport: Assessing the UK's Regional Digital Ecosystems (publishing.service.gov.uk)

Opportunities

1. **Using Data and Analytics to increase productivity across the region**

   Digitisation, through the application of Data, Analytics and other associated technologies have the potential to significantly increase productivity across the region anything up to 20% according to some measures[6]. Given the region's focus on manufacturing, this clearly could be incredibly beneficial with the lessons taken from the developing digital economy being applied within our more traditional industries.

   Many larger manufacturers will already have initiatives in place that are exploring this, often through partnerships with major solution vendors, consulting organisations or institutions such as the Manufacturing Technology Centre (MTC) in Coventry or through the High Value Manufacturing Catapult initiative sponsored by Innovate UK.

   For smaller organisations further down the supply chain, the digitization opportunity is the same if not greater. For example, a smaller company that can reduce its machine downtime through a combination of remote monitoring and predictive maintenance will arguably see greater benefits because of its scale. Having one machine out of four inoperable is clearly much higher impact than one out of tens or hundreds. It is these smaller operators who potentially may feel the benefits most, but they're also least likely to be able to start on the journey without help.

2. **Allowing UK companies to remain competitive internationally**

   As productivity continues to be an issue in the UK economy, digitisation through better exploitation of data and analytics represents a material opportunity not only to catch up but to potentially by-pass our nearest competitors. In 20187 the last studies by the Office of National Statistics to feature international comparisons, on average output per hour worked, placed the UK around 15% below the average for the rest of the G7 advanced economies[7]. Based on the last ONS productivity estimate from late last year, we also know that productivity has slipped with output being just over 1% below the 2019 average[8]. Better use of Data and Analytics won't be the only answer to the productivity issue, but it certainly represents a significant part of the solution.

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[6] [Industry 4.0 demystified--lean's next level | McKinsey](#)
[7] [International comparisons of UK productivity (ICP), first estimates - Office for National Statistics](#)
[8] [UK productivity flash estimate - Office for National Statistics (ons.gov.uk)](#)

3. **Effective exploitation of data has environmental and sustainability benefits**

   A recent study from Bain & Company and the World Economic Forum state that Digital technologies will be critical to achieving the sustainability goals of most companies and industries[9]. 40% of respondents to their survey said they believe digital technologies are already having a positive impact on their sustainability goals. For example, these could include areas such as optimisation of plant energy consumption, the optimisation of allocation of raw materials and production capacity via advanced scheduling systems or even enhanced reuse of resources and reducing carbon emissions through data-driven design.

   All of these types of initiative have the potential to have a material positive impact on both organisational productivity and profitability as well as helping the environment.

   In our view, sustainability and data initiatives go hand-in-hand. Embedding the understanding of how each benefits or advances the other is a great opportunity to move forward in both spaces.

4. **Reskilling and upskilling to create a digitised workforce where no one is left behind**

   Having the appropriate skills to better understand and make use of data is fundamental will be fundamental to the successful adoption of these initiatives.

   While skills, or lack thereof, features heavily in the discussion below, we must also recognise this represents an opportunity to develop our workforce – upskilling and reskilling to support future growth in this space.

   Taking the time to properly plan an integrated approach, starting with education and encompassing the public and private sectors can only be beneficial in the long term. This would also help make sure that workers from traditional industries aren't left behind as we grow the digitised workforce.

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[9] A Three-Part Game Plan for Delivering Sustainability Digitally | Bain & Company / How digital technology can improve your sustainability game | World Economic Forum (weforum.org)

5. **Take advantage of global supply-chain stress to reinvigorate local economies**

The ongoing tangible stress in long-distance global supply chains represents an opportunity for UK based companies to source locally, increasing the capacity and variety of the UK based supply-chain. Bringing manufacturing home can not only benefit the local economy, but also the environment as 'buying local' reduces the energy expenditure of transporting components vast distances. These shortening supply-chains has the potential to open up more opportunities for the manufacturing businesses in the UK, particularly those in the midlands as we already have the infrastructure base upon which to build. Manufacturing has fallen to around 10% of the UK economy from 20% in 1990.

Supply chain stress has the potential to get worse, so seeing this as an opportunity to taken advantage of using better data and analytics, rather than a problem to be managed, could begin to reverse some of this decline.

Lean manufacturing with localised & greener supply chains, paired with increased productivity enabled by digital transformation (all underpinned by data) could be the catalyst to drive up our output in such a way that benefits both people and the planet.

6. **Drive the development of AI outside of the financial sector**

The UK's AI startup scene has grown by 600% over past decade, with the sector bringing in £2.41 billion worth of investment in 2020 alone. According to Tech Nation's AI research[10], only 67 UK AI companies were founded in 2020 (down from 133 in 2019). That being said, UK AI saw a 17% increase in VC investment, which is more than any other country globally. Although the majority of these businesses operate in the financial sector (around 10%), AI is taking over multiple industries.

According to the Assessment of of the UK regional ecosystems, 6% of the region's digital sector companies identified a specialism in AI, so there is a small but growing regional hub of expertise that can contribute to the better exploitation of the technology in the wider local economy. While this point is focussed on AI, it can be extended to all major technologies including Augmented or Virtual Reality (AR/VR), 5G telecoms, the Internet of Things (IoT) which are all being rapidly adopted across the economy.

[10] The UK AI Startups to Watch in 2021 - TechRound

Failures and Threats

1. **The pitfalls of data exploitation must be considered as well as the benefits**

   Increased use of Data and Analytics in everyday business presents a real opportunity for increasing value and productivity, but there are also significant risks associated with these technologies. According to Made Smarter[11], an organisation which aims to enable digitisation of the manufacturing industry, some of the major challenges to be overcome in this space include;

   a. Competitive threats as other organisations aim to utilise these same strategies to evolve their own business models which could render any progress obsolete

   b. Displacement of manufacturing roles as further digitisation makes shifting operations to lower cost regions, or even simply reducing the number of workers required to achieve the same outputs

   c. Cybersecurity is also a prevalent worry. Securing digitally connected solutions and the data they contain is more important now than ever, especially where there is significant Intellectual Property behind a business. Protection from internal and external threat actors, be they competitors, non-governmental organisations or state-actors must be embedded within every solution, which can add complexity and cost if not done properly

   d. Data and privacy laws continue to evolve, and the penalties for non-compliance can be significant. The General Data Protection Regulation (GDPR) is still on the statute book despite BREXIT, and infringements can incur a maximum fine of £17.5 million or 4% of annual global turnover. Ignorance of these regulations is neither defence nor excuse, so organisations must be mindful of how they manage the data they gather, store and use. For example, British Airways was fined £20m after a data breach resulted in customer information being stolen. The regulator stated the breech happened due to BA negligence and was going to fine them £184m. This was only reduced as the impact of the Global Pandemic was taken into account.[12]

   e. The UK Government is consulting around the future of GDPR, and there is a risk that some elements of the legislation will be watered down which may result in unforeseen issues. For example, Article 22 of the UK GDPR has additional rules to protect individuals where solely automated decision-making relating to legal

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[11] UK Digital Manufacturing advice & innovation – Made Smarter
[12] Three years of GDPR: the biggest fines so far - BBC News

or other areas that may have significant impacts on them.[13] The Government is suggesting removal of this provision, which would be a retrograde step which could do more harm than good.

There are many areas which require detailed discussion with people who have the right expertise to fully understand and advise on the the implications of any decisions made, not properly considering these could have wide-ranging and damaging impacts not only on individuals, but our ability to trade with other countries who's laws may differ from our own.

So, while there are significant benefits to be had, organisations must also be aware of the risks and manage them accordingly. Having the right people with the right skills and experience available is key to successfully crossing this minefield.

2. Outsourcing data expertise will curtail digitisation of our economy

The increasing involvement of foreign owned organisations in critical national data-programmes also poses an increasing competitive threat to the development of critical data skills in the region and the country more broadly.

A great example of this is the growing number of NHS data initiatives where foreign organisations are being selected to help deliver needs at the expense of home-grown talent. This wholesale outsourcing of these capabilities to foreign organisations impacts our ability to nurture home-grown talent in a rapidly advancing space.

The US firm Palantir's relationship with the NHS is a particularly interesting example. They were awarded a two year contract extension worth tens of millions of pounds to provide a data platform to help with the distribution of the COVID-19 vaccine.[14]

This type of relationship with our major public sector organisations would therefore ideally be based around seeking British companies to help them meet their needs. Another aim should be encouraging regional development, so the capabilities are not all London-centric.

If regional public sector bodies put buying locally at the centre of their data initiative procurement strategies, this will help to grow the industry in the UK.

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[13] Rights related to automated decision making including profiling | ICO
[14] NHS awards £23m two-year deal to controversial Peter Thiel AI firm Palantir • The Register

Outsourcing manufacturing has halved our capacity since 1990, as we've moved to a more services-and-information focussed economy, we should not be outsourcing the very skills that will underpin our success in this area going forwards. The public sector can have a transformational role in setting strong foundations, especially in the regions.

There is also an argument that involving controversial foreign firms in critical national data programmes add unnecessary complexity to what is already a far from straightforward subject area. Data initiatives are fraught with potential pitfalls, especially where personal data is concerned. There is an element of trust provided here, so selection of the right people to help, cannot just consider location, skills, capabilities and cost. Reputation and ethics must also writ large in these decisions and any organisation that is unable to demonstrate the highest moral standards in this space should not be considered as partners.

Public organisations, when beginning or evolving their data initiatives should firstly look at how wholly British organisations, from across the private, public and academic spheres to understand how they can meet their needs. This will help ensure the profits from public investment remain in the UK helping to grow our circular data economy.

The government already acts where there are security concerns over foreign owned companies' involvement in critical national infrastructure[15], why should data be treated any differently?

3. **The right skills are required for success**

Having the right skills within an organization to properly shape and deliver data and analytics initiatives is imperative. This is not only about identifying the problems and solutions to solve them, but also how to drive a cultural shift to embed data literacy across the business.

Research suggests that this data literacy, which is defined as: *the ability to read, write and communicate data in context, with an understanding of the data sources and constructs, analytical methods and techniques applied, and the ability to describe the use case application and resulting business value or outcome*[16] is single biggest determinant of a successful deployment of data, analytics and AI within an organisation[17].

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[15] Huawei to be removed from UK 5G networks by 2027 - GOV.UK (www.gov.uk)
[16] Definition of Data Literacy - Gartner Information Technology Glossary
[17] Data and Anaytics Leaders: Rewire your culture for an AI-Augmented Future, Andrew White, Gartner February 2020

Having access to the right subject matter experts who can see and enable all the composite parts of an effective data initiative will be one of the major short-term challenges to exploitation.

4. **Poor productivity is a barrier to growth**

A recent analysis discussing the prospects for regional disparities arising across the UK post-BREXIT & COVID[18], states productivity is the main source for long-term economic growth. It also points out regional economic disparities tend to arise when highly productive firms and workers cluster in some places. The unfortunate reality is those clusters are currently focussed on London and the South East.

The paper notes that factors that determine where organisations cluster include spending on research and development, worker skills and education, and investments in infrastructure. In the UK, spending in these areas is considerably higher in London and the South East as compared to the rest of the country. Education levels of worker are typically higher too.

Therefore these factors must be accounted for when considering how to best deliver a skilled local workforce to support these types of D&A initiatives for organisations of all sizes across the region.

5. **Hybrid working makes the war for talent more complex**

The recent increase in hybrid working, blending home and office working is also putting the Midlands in direct competition with major global centres like London for talent. People can now conceivably live in the midlands and work in London – visiting a few days in the month for specific activities.   Therefore – in order to secure the right skills and talent; organisations in the Midlands therefore have to consider how they will compete with their peers in London or other major centres around the UK.

6. **Skills bottlenecks may export value from the region**

People constraints may also drive a switch to employing more external consulting services rather than growing talent within organisations. While this can accelerate first steps or help organisations with understanding how to take advantage of Data related strategies and technologies, it has the potential to stifle the development of sustainable in-house capabilities in these important areas as consultancies tend to

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[18] Bhattacharjee, A, Nguyen, D & Venables, AJ 2020, 'The prospects for regional disparities in the UK in times of Brexit and COVID-19', National Institute Economic Review, vol. 253, pp. R1-R3. https://doi.org/10.1017/nie.2020.25, introduction_DNTV.pdf (hw.ac.uk)

want to develop long-term revenue streams for services if they can. This can prove expensive in the long run as these types of services can attract premium prices.

While this has the potential to benefit those professional services firms with the right skills sets – some of whom are flourishing in the midlands; but there is also a risk that global players with large workforces absorb this work, limiting the benefit to the region.

There are naturally a few exceptions where in house capabilities are well established. But these tend to be associated with large organisations with the budgets to support them, Rolls Royce's R^2 Data Labs for instance. For smaller businesses further down the supply chain this concentration of skills makes the development, acquisition and retention of the right talent even harder.

7. **Old-style thinking may inhibit progress**

Many organisations have previously not placed much importance on data and analytics initiatives, treating them as very much secondary priorities. This mindset still exists, especially in some of the more traditional industries.   Where this view persists, organisations will find their ambitions inhibited by these legacy behaviours. To succeed these initiatives need a named executive within the business to take ownership – therefore educating the decision makers to the benefits of use of Data & Analytics becomes key as lack of sponsorship and ownership represent one of the major failure points in this space[19]. Many newer firms are innovative by necessity and have no issues with understanding in this area, but it is the traditional industries where maybe most help and education is needed to address potential weaknesses.

[19] Build a Data Driven Enterprise, Rollings & White, Gartner, 2018

Conclusion

This is a wide-ranging subject, and it's not feasible to address every issue highlighted above immediately. But, to suggest some first steps that have the potential to make a positive impact, consider the following:

- Bet on home grown talent rather than investing in foreign firms. This is especially important for public sector bodies who, in our view, have a moral responsibility to 'buy-local' if they can. This will support creation of new jobs and enhancement of necessary skills in the region. This is something that can happen immediately.

- Focus skills funding to support the growth agenda. The skills question is a difficult one. Given funding for this is likely to remain scarce for the foreseeable future, it must be directed towards initiatives that will benefit the development of the digital economy. This unfortunately means hard choices will have to be made. It is suggested that time and treasure is focussed on initiatives that develop the skills of the workforce, current and future, which may come at the expense of more socially focussed initiatives in the short term.

- This is suggested as a tactical rather than strategic approach but we must grow our economy to allow us to spend more on purely social programmes; *because without that growth the resources will simply not be available to support them*.

- Ensure diverse views are included when creating future data legislation. Getting as diverse a cross section of the economy involved in the process for the creation of legislation, with equal importance given to both private and public is key. As is looking beyond the "London bubble" for input. The more the implications of decisions can be understood, and likely impacts on all stakeholders, the less likely we will be to see situations where poor and ill thought-out legislation has predominately negatives impacts on an industry area – the HMRC's IR35 regulations being a case in point.

- On a more positive note, the creation of better and more flexible law in this space has the real potential to enhance the UK's competitiveness compared to our trading partners. This not only relies on Westminster's willingness to look outside of the South East for input, but also on those of us in the regions being able to provide constructive support.

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Tim has spent almost 20 years in Enterprise Architecture and Senior IT Management roles across both consulting and industry. He spends his time advising customers on their IT and Data Strategies, including the operating models, solutions, roadmaps and business cases that enable them.

He is also responsible for the shaping and delivery of the Solution, Architectural, Technical and Data streams across all phases of complex business transformations as well as the development of Kagool's architecture team and associated capabilities. His experience crosses multiple enterprise applications and platforms including SAP, MS Azure, Salesforce and other key emerging technologies.