

The background features a large, abstract graphic composed of numerous green dots and thin lines, resembling a complex network or data visualization. The dots are concentrated in two main areas, one at the top and one at the bottom, with lines connecting them to form a central, funnel-like shape. The overall effect is a sense of dynamic movement and interconnectedness.

AI for Services

Full Report 2020



Innovate
UK



AI for
Services

This report was commissioned from London Economics by KTN with funding from Innovate UK and on behalf of AI for Services.

AI for Services is a joint initiative set up by KTN and Innovate UK to bring together Data and Artificial Intelligence businesses and academics with professionals working in the professional and financial services sectors. This initiative is part of the Industrial Strategy Next Generation Services Challenge programme. Through this challenge, government is supporting industry and researchers to develop next generation services that can transform the UK's services industry. £20 million of funding has been allocated to projects exploring how new technologies could transform the UK accountancy, insurance and legal services industries.

KTN exists to connect innovators with new partners and new opportunities beyond their existing thinking – accelerating ambitious ideas into real-world solutions and as a result drive positive change. KTN occupies a unique position in the UK innovation eco-system sitting at the interface of the public and private sector. KTN supports government departments and funders in the delivery of interventions aimed at addressing market and system failures in innovation and enable businesses and entrepreneurs in their innovation ambitions to forge powerful connections, access funding and make investments. For more information, please visit www.ktn-uk.org

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UKRI works with the government to invest over £7 billion a year in research and innovation by partnering with academia and industry to make the impossible, possible. Through the UK's nine leading academic and industrial funding councils, UKRI creates knowledge with impact. For more information visit www.ukri.org

The Industrial Strategy Challenge Fund aims to bring together the UK's world leading research with business to meet the major industrial and societal challenges of our time. The fund was created to provide funding and support to UK businesses and researchers, part of the government's £4.7 billion increase in research and development over the next 4 years. It was designed to ensure that research and innovation takes centre stage in the Government's modern Industrial Strategy. It is run by UK Research and Innovation.



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Authors

Daniel Herr, Senior Economic Consultant, dherr@londoneconomics.co.uk, +44 (0)20 3701 7715

Moritz Godel, Divisional Director, mgodel@londoneconomics.co.uk, +44 (0)20 3701 7708

Ryan Perkins, Economic Consultant, rperkins@londoneconomics.co.uk, +44 (0)20 3701 7722

James Forrester, Economic Analyst, jforrester@londoneconomics.co.uk, +44 (0)20 3701 7700



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Table of Contents

Page

Foreword	2
AI for Services Report 2020	3
Executive Summary	4
1 Introduction	8
2 From strength to strength: AI is transforming some of the UK's most prestigious sectors	10
3 Market uptake and adoption of AI and data technologies in the UK services sector	23
4 The future of AI and data technologies in the UK services sector: Enablers and barriers	37
5 The impact of COVID-19	52
6 Recommendations	59
References	64
ANNEXES	72
Annex 1 Index of Tables and Figures	73
Annex 2 Comparison of AI and data in the insurance, legal and accountancy services sectors.	75
Annex 3 AI/data accelerators and incubators	77
Annex 4 Funders with a specialisation in AI and data tech	78
Annex 5 Stakeholder consultations	79

Foreword

AI for Services was established over a year ago to support the objectives of the £20 million Next Generation Services Industrial Strategy Challenge Fund programme by bringing together professionals working in the accountancy, insurance and legal sectors with high growth entrepreneurs and leading academic experts researching and developing innovative solutions in Artificial Intelligence & data technologies.

The rapid growth of the network and popularity of our activities has shown the readiness of the UK services sectors to adapt and has confirmed its appetite in using novel technologies to solve its business challenges. It has also validated the UK's strength in Artificial Intelligence and data technologies coming from the burgeoning start-up scene and the academic research engagement. The recent COVID-19 crisis has only made our work more relevant with firms embracing digital tools in their daily activities to stay open for business. Moreover, businesses are using this newly created work environment as an opportunity to redefine their long-term strategic goals to include specific digital transformation commitments and build future resilience in their activities.

One of our priorities is to develop a better understanding of the adoption and use of AI and data technologies in the UK high value services sector and identify the sectors' strengths and challenges with a view to encourage greater levels of research and development in this area. Our first report provides evidence that the size of the opportunity for the UK is far-reaching by quantifying the historical and economical strength of the services sectors and identifying the benefits AI and data technologies can bring in terms of performance, productivity, competitiveness and access to services. The findings show that the UK is well placed to take advantage of this opportunity with a strong AI and data sector and a thriving well established fintech cluster. The current state of play of innovation in the insurance, legal and accountancy sectors further demonstrates that transformation is already happening. The report reveals the key drivers shaping innovation and subsequent challenge areas for the UK to address such as translating research into commercial applications, access to funding and skill shortages. Looking at the future of the sector our study confirms the important role AI & data technologies will play and suggest an acceleration of adoption and investment as a result of the COVID-19 crisis.

AI for Services already counts more than 1,200 leading businesses, researchers, firms and investors coming together to support the transformation of the UK services sectors and its global leadership position and demonstrate the opportunity and benefits of undertaking research and development. It also acts as a network of networks to share learnings, discuss common challenges and further encourage innovation transfer.

After reading this insightful report, I hope that you too join AI for Services and help us drive positive change in the sector.

Astrid Ayel

AI for Services Lead

KTN

AI for Services Report 2020

Artificial Intelligence (AI) and other data technologies are set to impact almost every sector of the economy, bringing significant opportunities for UK businesses. Across the accountancy, insurance and legal sectors AI and data also have the potential to transform the way businesses interact with customers, deliver better, more personal products and services, and bring systemic benefits such as better allocation of capital, better corporate governance and wider and improved access to services.

The AI for Services Report provides up to date insight into the state of play of AI and data technologies for the accountancy, insurance and legal services sectors, based on comprehensive research and new evidence from twenty interviews and two original surveys of industry participants. While LegalTech, InsurTech and AccountTech in the UK are less mature than fintech sector, transformation is already underway, with significant growth in innovation and technology adoption across the services sector. This study identified a total of 553 AI and data companies working across the legal, accountancy, and insurance services sectors and found evidence of increasing levels of investment by incumbents across all three sectors.

COVID-19 has only accelerated the pace of change, with businesses embracing digital technologies at an unprecedented scale in order to carry on working remotely and stay operational. Despite the short-term pressures, 97% of firms surveyed for this study on the impact of COVID-19 on the services sector agreed that the crisis presented an opportunity to follow on the momentum of digital transformation; 90% also agreed that it accelerated culture change; and 89% indicated that they expected new tech firms and AI providers to emerge in the wake of the crisis. This further highlights the importance of AI and data for the services sector as we emerge from the crisis.

This report highlights that the UK services sector is in a good position to benefit from AI and data, with a strong research base, a thriving industry landscape, a strong funding environment compared with other European markets, targeted acceleration and incubation initiatives, and a supportive policy framework. However, use of AI is often restricted to experimental projects or minor business functions. Cases of widespread adoption across all business functions, or indeed business model transformations to fully AI and data-centric companies, remain rare at this stage. Moreover, there are a number of challenges facing UK companies, and areas where the UK could improve. These include translating research into commercial products and services; scaling up innovative companies; improving access to funding (which, despite the UK's comparatively strong position in Europe, is significantly more challenging compared to the US and China), access to skilled labour; and structural features of the sector.

This report:

- highlights the substantial size of the opportunity and the UK's strength in AI and data technologies;
- discusses the state of play of AI and data innovation in the services sectors and adoption by incumbent firms;
- examines the drivers shaping innovation, and challenges faced by the sector;
- investigates the future of AI and data in the sector, the factors driving adoption and the impact of COVID-19; and,
- provides a SWOT analysis together with actionable steps that actors in the sector can take to ensure the services sector reaps the maximum benefit from AI and data.

We hope this report proves valuable to policy makers, support organisations, incumbent firms and innovators alike. We would like to thank all individuals and organisations that contributed to this study for the valuable advice and information provided. London Economics would also like to acknowledge the useful guidance and feedback provided by the KTN and Innovate UK throughout this research. Responsibility for the contents of this report remains with London Economics.

Executive Summary

AI for Services, on behalf of the Knowledge Transfer Network (KTN) and UK Research and Innovation (UKRI), have engaged London Economics (LE) to produce a **UK wide industry mapping report on Artificial Intelligence (AI) and data technologies** for the **accountancy, insurance and legal services sectors**. This report offers new insights into the aspects shaping innovation in the accountancy, insurance and legal sectors, current areas of strengths and specialisms, market uptake, as well as the challenges and barriers facing both companies seeking to adopt and startups seeking to innovate.



The size of the opportunity

AI and data technologies have the potential to deliver significant economic benefits for UK businesses and the wider economy. AI could contribute an additional \$15.7 trillion (£11.9 trillion) to the global, and €2.7 trillion (£2.4 trillion) to the European economy by 2030 (PwC, 2017, and McKinsey, 2019). Within services, AI could lead to a gain in GDP in the global financial and professional services industry of approximately 10% by 2030 (PwC, 2018).

Across the accountancy, insurance and legal sectors AI and data also have the **potential to transform the way businesses interact with their customers, deliver better, more personal products and services to customers, and deliver systemic benefits such as better allocation of capital, better corporate governance and better access to justice.**

The current COVID-19 crisis has only accelerated the pace of change, with many businesses previously hesitant now actively embracing digital technologies to carry on working remotely and stay operational, and to control costs and manage risk. As a result, there is an increased engagement and interest in technology; however, **the opportunity now lies in going one step further: changing ways of working and developing new business models.**



The special position of high-value financial and professional services in the UK

In contrast to the industrial revolutions of the past, **AI and data are poised to mostly affect the work of white-collar, better-educated and higher-paid workers (Muro et al., 2019).**

The **services sector dominates the UK economy, accounting for approximately 80% of UK gross domestic product (GDP) and employing around 85% the UK workforce.** The sector is a major source of the UK's global competitiveness, being second only to the US in terms of services exports (totalling £245 billion in 2016) (ONS, 2019a and 2019b, and Government Office for Science, 2018). Given the significance of the services sector for the UK economy, adoption of AI and data technologies in the services sector could have far-reaching economic effects for the UK.

Within services, high-value services are a particular UK strength, with the legal, financial and insurance, and accountancy services sectors alone accounting for more than 12% of UK output and London remaining one of the leading UK financial and legal centres world-wide.



The state of play

AI and data technologies are already transforming the services sector. Our research identified, a **total of 553 AI and data companies working in the accountancy, legal and insurance services sectors** (Figure 11). Moreover, incumbents across all three sectors are increasingly investing in, and adopting, AI and data technologies, highlighting the fact that AI and data innovation is already taking place across the services sector.

Much of the innovation activity is concentrated in London, with **around three out of every five tech firms and startups** in the accountancy, insurance and legal services sectors **located in London and surrounding areas** (Figure 2). Nevertheless, significant activity is also taking place across the UK, with pockets of activity also identified across the South East, East of England, North West as well as Scotland. Regional centres exist around Bristol, Cambridge, the North West, and Edinburgh.

Figure 1 Sectoral split of identified companies

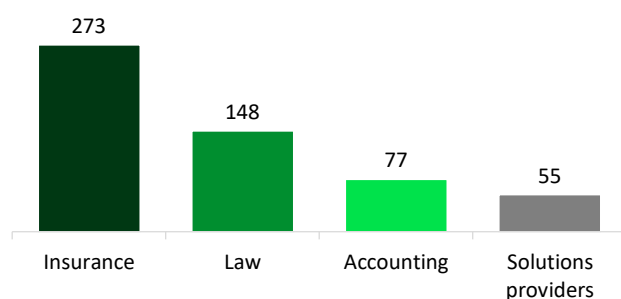
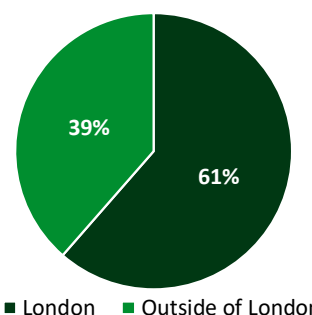


Figure 2 Location of identified companies



Note: Solutions providers refers to AI and data solutions for the financial/professional services sector without a specific focus on any one of the three sectors. A small number of companies identified were placed at the intersection of two of the three sectors, these were assigned to the sector that most closely matched their activities to avoid double-counting. *Source: London Economics*

Although examples where AI and data technologies have delivered benefits to services companies are already emerging, the full effects are yet to materialise. Many incumbent firms are already investing in, and adopting, AI and data technologies or are planning to adopt in the near future. However, use of AI is often constricted to experimental projects or use in some limited business functions. **Cases of widespread adoption of AI and data technologies across all business functions, or indeed business model transformations to fully AI/data centric companies, remain rare.**

Nevertheless, **the UK is well placed to take advantage of the opportunities AI and data bring.** The UK already has a strong AI and data ecosystem with:

- **a strong research base**, ranking fourth in terms of the number of publications in AI research between 2015 and 2018 and third in terms of number of citations (AI Index Report, 2019);
- **a thriving industry landscape**, with London alone having an AI supplier base of 758 companies, twice as many as Paris and Berlin combined (CognitionX, 2018), and 35 further AI and data clusters across the UK (Forth, T. et al., 2018);
- **a strong funding environment compared with other European markets**, with the UK ranking eighth in terms of private investment in AI in 2018 per million of GDP and UK AI companies having received the most funding in 2018-19 outside of the USA and China (AI Index Report, 2019); and,
- existing acceleration and incubation initiatives (see Annex to this study), and a recognition by Government of the importance of AI and data resulting in strong policy support.



Where could the UK do better?

Overall, the UK services sector is in a good position to reap the benefits of AI and data technologies. Nevertheless, there are a number of challenges and barriers facing UK companies and innovators as well as areas where the UK has room for improvement; these include:

Divide between academic research and commercial applications

- While UK AI and data research is excellent, the study findings suggest that the UK is not as good at translating research into commercial products and services, creating a gap between academic research and commercial applications.

Access to funding and the scale-up challenge

- The UK has a comparatively strong funding environment. Nevertheless, access to funding was identified as a particular challenge faced by AI and data companies. A number of Government and private funding schemes as well as acceleration and incubation initiatives to help innovative startups already exist. However, accessing funding remains a particular challenge faced by many companies seeking to scale, with scale-ups needing larger funds than startups, but fewer investors able to provide follow-on investments at later stages.

AI and data skills shortages

- Access to staff with the right skills to exploit AI and data technologies remains a key challenge for, and barrier to, adoption of AI and data. However, it is not only trained data scientists and AI professionals that are required. More and more an understanding and appreciation of digital technologies is also required among lawyers, insurers and accountants in order to make the most of the benefits AI and data can offer. This highlights the need for change in academic courses as well as upskilling of the current workforce.

Access to incumbent firms

- AI and data startups often have difficulty accessing incumbent firms. Of course, gaining market traction as an innovator in any sector can be difficult. Moreover, many providers have emerged in the InsurTech and LegalTech scenes over the last few years, which means the landscape can be confusing for law firms and insurers and knowing which products will deliver real benefits for them can be difficult.

Structural features of the services sector

- Structural features of the services sector pose an additional challenge. For example, the partnership model, prevalent among many legal and accountancy firms, and the billable hour model in the legal sector, mean that finding time and funds for the exploration of AI and data technologies can be costly for partners and may thus not be a priority. At the same time, while many firms have innovation or technology officers, they often do not make the decisions on what to adopt or invest in. In some cases, there may also be cultural factors preventing adoption, such as a reluctance to explore new technologies or a limited understanding of AI and data, particularly among senior decision makers.

Legacy systems and data 'silos'

- Challenges also exist around legacy systems and infrastructure, and data 'silos' which need to be addressed prior to being able to fully exploit the benefits of AI and data for the services sector.

Other challenges

- In addition, there are a range of other challenges such as ethical and liability concerns, cybersecurity, and privacy and data protection issues, and regulatory challenges to name but a few.

? The impact of COVID-19

The COVID-19 crisis and the consequent public health measures have had and will continue to have a profound impact on society and the way that people work. In the short term, the pressures created by the crisis and lockdown are set to lead to significantly reduced startup activity and innovation, and are expected to significantly impact adoption of AI and data technologies by services sector firms. However, while the short-run impacts on the services sector look to be profound, it seems likely that the trends towards digitalization and AI adoption will be accelerated over the medium term as the sector recovers from the initial shock of the COVID-19 crisis.

Over the short to medium term, a crisis among tech startups could pose an opportunity for established solutions providers to gain market shares and strengthen their hold on the market, as well as for incumbents able to strengthen their in-house capabilities through acquisitions of failing startups or stepping up hiring of those with the advanced technical and data skills. Further adoption of AI and data technologies may therefore be driven by consolidation of firms in the market as well as acquisitions strengthening in-house talent, skills and tools among incumbents.

Recommendations

Given this background, this study provides concrete steps Government, support organisations, incumbent firms and innovators in the sector can each take to ensure the UK's services industry reaps the maximum benefit from AI and data:

Recommendation 1: Continue to tackle the funding and skills challenges

Recommendation 1.1: Incumbent firms should continue to focus on upskilling and reskilling

Recommendation 1.2: Policy makers and sector bodies should create policies that are targeted at meeting the skills requirements of the future

Recommendation 1.3: Government should address the scale-up challenge as a matter of priority

Recommendation 2: Make data fit for innovation

Recommendation 2.1: Regulators and tech providers should work on creating data standards and common interfaces

Recommendation 2.2: Incumbents should upgrade their data infrastructure

Recommendation 3: Foster an innovation culture

Recommendation 3.1: Incumbents should consider whether their current organisational structures are conducive to innovation

Recommendation 3.2: Firms should think carefully about the problems they face and avoid innovating for innovations' sake - sometimes much simpler solutions are more appropriate for the problems at hand than advanced AI techniques

Recommendation 4: Create meaningful partnerships

Recommendation 4.1: Incumbents should be transparent about the challenges they are facing and open to solutions from outside their organisation

Recommendation 4.2: Innovators need to recognise the difficulty in evaluating potential AI solutions for incumbents and be clear about the value their solution brings

Recommendation 4.3: Policy bodies and support organisations should continue to promote partnerships and knowledge transfer

Recommendation 5: Create regulation that is conducive to innovation

Recommendation 5: Government and regulators should work with industry to ensure that inadequate regulation, or indeed a lack of regulation, does not hinder innovation

1 Introduction

In January 2020, AI for Services, on behalf of the Knowledge Transfer Network (KTN) and UK Research and Innovation (UKRI), engaged London Economics (LE) to produce a **UK wide industry mapping report of AI and data technologies** for the **accountancy, insurance and legal services sectors**.

The study comes at a time when the advent of new technologies such as Artificial Intelligence (AI) and other data technologies is set to **impact almost every sector of the economy, bringing with it a significant opportunity for UK businesses and the wider UK economy**. PwC (2017) and McKinsey (2019), respectively, estimated that **AI could contribute an additional \$15.7 trillion (£11.9 trillion) to the global, and €2.7 trillion (£2.4 trillion) to the European economy by 2030**. While such estimates are naturally surrounded by significant uncertainty, they undoubtedly highlight the potentially sizeable price that these technologies could bring.

The current COVID-19 crisis has only accelerated the pace of change, with many businesses previously hesitant now actively embracing digital technologies to carry on working remotely and stay operational. As a result, there is an increased engagement and interest in technology; however, **the opportunity now lies in going one step further: changing ways of working and developing new business models**.

In the services sector, the rise of AI and data technologies across the accountancy, insurance and legal sectors brings **significant opportunities for companies looking to reduce costs, improve efficiency and deliver a better or more personal experience to their customers**, as well as for companies and particularly startups innovating within the AI and data space.

Given the significance of the legal, accountancy and insurance services sector for the UK economy – services account for approximately 80% of UK gross domestic product (GDP) and employing around 85% the UK workforce (ONS, 2019a and 2019b) – **adoption of AI and data technologies in the services sector also presents a sizeable opportunity for economic growth**. Estimates by PwC (2018) suggest that AI could lead to a gain in GDP in the global financial and professional services industry of approximately 10% by 2030.

At the same time, **the rise in advanced technologies also brings significant challenges** for existing players in the sector, including **competition from non-typical players** such as tech firms and startups. The rise of AI based technologies also brings **challenges for regulators**, who need to keep up with the ever-changing tech landscape in order to protect customers without restraining innovation.

Given this background, the AI for Services Industry Report 2020 provides companies working in the sectors, wider Government, trading associations, academic institutions as well as other stakeholders with a **key evidence base of the state of play of AI and data technologies in the accountancy, insurance and legal services sectors**. The report also provides recommendations identifying the key opportunities and challenges faced by the sector.

The report supports the KTN and UKRI's efforts, as part of the Next Generation Services programme, to support the sector's engagement in R&D in the emerging new technologies based on Artificial Intelligence (AI) and the data economy in order to maintain the leadership position of the UK in global high-value services. The Next Generation Services programme forms part of the wider UK Industrial Strategy, which identified AI and data as one of four 'Grand Challenge' areas. The scope

of the programme is limited to legal, accountancy and insurance services, as these sectors were identified to face similar opportunities and challenges, including the opportunity for cross-sectoral collaboration.

1.1 Study objective and approach

The study provides a **mapping of AI and data technologies** in the **accountancy, insurance and legal services sectors**. It updates and expands the evidence base on **the UK's strengths, specialisms and value** in developing AI and Data technologies for the accountancy, insurance and legal services sectors, including the value **of research and development** in this area.

The following sources of evidence were used in the study¹:

- First, **a review of existing literature and studies** relating to AI and data technologies in the accountancy, legal and insurance services sectors, as well as the wider AI and data literature, was carried out.
- Second, **the different actors within the legal, accountancy and insurance AI and data technologies ecosystem were mapped out** using data from a number of databases including: Crunchbase, BvD Fame, the Digital Insurer InsureTech Directory, the InsurTech Industry Directory, the LegalGeek Startup Map, and the exhibitor list of Accountex 2020.
- Third, primary data collection in the form of an **online survey** of AI for Services Members and other organisations in the accountancy, insurance and legal services sectors was conducted to collect data and evidence from key stakeholders. 93 responses were received. The online survey was supplemented via **in-depth interviews with 20 organisations** including incumbent firms, AI and data tech startups, and support organisations.
- Finally, **eight case studies** were developed to highlight the study findings and providing examples of how AI and data technologies can bring benefits to the services sector.

Based on the information collected, SWOT analysis of AI and data technologies in the accountancy, insurance and legal services sectors in the UK was conducted. Based on this analysis, a number of recommendations for the sector and wider Government to exploit opportunities of AI and data technologies within the sector were formed.

¹ See Annex 4 for details on the primary research.

2 From strength to strength: AI is transforming some of the UK's most prestigious sectors

AI and data technologies have far-reaching economic effects, with the potential of bringing significant opportunities for companies looking to reduce costs or improve efficiency, as well as, for transforming the way businesses interact with their customers and the personalisation of products and services.

As this section highlights, the UK financial and professional services sectors are a traditional strength of the UK and are in a good position to benefit from AI and data technologies with a strong research base, a thriving industry landscape, a strong funding environment compared with other European markets, existing acceleration and incubation initiatives, and a recognition by Government of the importance of AI and data.

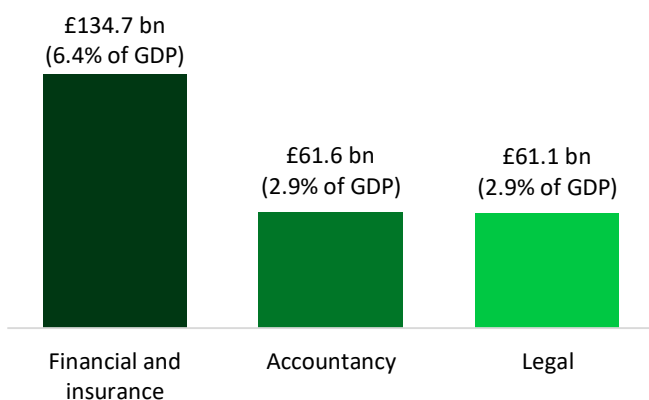
This section first provides a brief overview of the importance of the services sector to the UK economy (Section 2.1). It then discusses the ways in which AI and data technologies are transforming the UK services sector and the opportunities that AI and data technologies can bring (Section 2.2). Finally, Section 2.3 shows why the UK is in a good position to benefit from the opportunities of AI and data technologies.

2.1 High value financial and professional services are a traditional strength of the UK economy

The services sector is a traditional strength of the UK economy. Services dominate the UK economy, accounting for approximately 80% of UK gross domestic product (GDP) and employing around 85% the UK's employees (ONS, 2019a and 2019b). Moreover, the sector is a major source of the UK's global competitiveness, being second only to the US in terms of services exports (totalling £245 billion in 2016) (Government Office for Science, 2018).

Within services, high value financial and professional services are historically particular areas of UK strength, with London remaining one of the leading UK financial as well as legal centres world-wide. Today, the legal, financial and insurance, and accountancy services sectors alone account for more than 12% of UK output (Figure 1).

Figure 1 Contribution of accountancy, legal and insurance services to UK economy



Note: In 2019 prices. Financial and insurance, and legal sector contributions based on 2018 reference year. Accountancy sector contribution based on 2017 reference year. Contributions deflated to 2019 prices using ONS GDP deflators. GDP contribution calculated based on ONS 2019 GDP figures. *Source: Financial and insurance: Rhodes (2019); Accountancy: Oxford Economics (2018); Legal: Sharp et al (2020); and Office for National Statistics data*

Dentons: AI and data technologies are delivering value for the world's largest law firm



Who are Dentons?

Dentons is a global law firm and the world's largest law firm by headcount. In the UK, Dentons has offices in Aberdeen, Edinburgh, Glasgow, London, Milton Keynes, and Watford.

How does Dentons use AI?

Dentons has been keen to adopt new technologies to enhance productivity of their highly skilled lawyers. In 2015, Dentons launched Nextlaw Labs, a global legal tech accelerator and innovation consultancy, which pilots and adapts technology for the legal sector. Together with its sister company, Nextlaw Ventures, a legal tech venture capital investor, Nextlaw supports high-potential legal tech startups and legal sector clients to drive adoption of legal tech solutions that improve quality and efficiency.

To make the business case for the company-wide roll out of an AI platform for document review, Dentons carried out a rigorous performance test and assessment. The platform allows lawyers to feed-in a large number of documents, which are then analysed by the software to provide lawyers with a range of information about the documents. This includes the type and number of key clauses present, regional activity, and whether any anomalies such as missing clauses were detected.

Dentons is also exploring the use of AI and data technologies for document drafting. In particular, they are currently looking at implementing a knowledge management system that would use AI to pull out similar clauses from a knowledge bank to help populate an initial draft document.

What were the challenges you faced, and what are the benefits?

Despite the software's maturity, Dentons' testing revealed a number of challenges for operational use. First, it struggled with property related documents. While the reasons for this are not clear, it could be because of the less machine-readable nature of property documents, many of which are handwritten or old scans. Second, while the software works well in English and other widely used languages, its performance varies in other languages.

In addition to technical challenges, the nature of legal work also presents significant risks. While AI can in principle generate significant time-savings, it is not necessarily 100% accurate, and the consequences of missing key clauses in important work would be significant. Therefore, Dentons sees AI technologies as mainly complementing the work of lawyers. Legal research technologies allow lawyers to rapidly gain an overview of a large number of documents. This enables them to quickly generate insights, which could be used to provide clients an initial response within a very short amount of time. However, manual research by experienced lawyers will remain key, in order to verify and build upon initial insights gained by technology.

Key takeaways:

- AI can generate significant time savings for legal research and document drafting in principle. However, the significant liability and reputational risks if something goes wrong mean that, at least for high value work, manual research and drafting by lawyers in tandem with technology efficiency gains will remain key for the foreseeable future.
- Where AI can add real value is by allowing firms to provide initial insights to clients (with the necessary caveats) much more rapidly. Initial insights can then be verified via manual research later on to provide confidence.

Source: London Economics based on an interview with Dentons

2.2 AI and data technologies are transforming the UK services sector, bringing significant opportunities for UK businesses

AI and data technologies have the potential to bring significant opportunities for incumbent companies looking to reduce costs, improve efficiency and deliver a better or more personal experience to their customers; for companies and startups seeking to innovate in the sector; as well as for the services sector and UK economy more widely.

PricewaterhouseCoopers (2017) estimated that **global GDP could be up to 14% higher in 2030 as a result of AI, contributing an additional \$15.7 trillion (£11.9 trillion) to the global economy** and making AI the biggest commercial opportunity today. More recently, McKinsey (2019) estimated that **if Europe develops and diffuses AI according to its current assets and digital position relative to the world, it could add some €2.7 trillion (£2.4 trillion), or 19 percent, to output by 2030**. While estimates of future impacts are naturally surrounded by significant uncertainty, the figure undoubtedly highlights that AI and data technologies could bring significant benefits and opportunities.

Given the significance of the legal, accountancy and insurance services sector for the UK economy (see Section 2.1), **adoption of AI and data technologies in the services sector presents a sizeable opportunity for the UK**. High value financial and professional services are a traditional strength of the UK economy, and the UK is ideally placed to take advantage of new technologies in these sectors and bolster its international competitiveness while improving services for users.

On the one hand AI and data technologies have the potential to bring significant opportunities for incumbent companies looking to reduce costs or improve efficiency by providing a new wave of automation.

In contrast to previous waves of automation, in industries such as manufacturing, which have often affected lower-wage and blue-collar work, **AI is poised to mostly affect the work of white-collar, better-educated and higher-paid workers**. Those working in jobs within the service sectors, including law, insurance and accountancy, are therefore most likely to be affected by advancements in AI (Muro et al., 2019). Impacts arising from this new wave of AI automation can broadly be categorised into three channels (Muro et al., 2019):

- Impacts arising from **substitution** of work from humans to AI, thereby **reducing costs** and potentially **improving performance**. For example, workflows from roles such as transcription, demand forecasting and financial analysis are becoming broken down into prediction tasks which can be performed by AI applications instead. In the services sector a number of AI applications substituting labour, for example by automating scanning and prediction tasks such as automation of document review, are also already emerging. While this effect is unlikely to lead to mass-unemployment of lawyers, senior accountants and insurers, who will continue to make the ultimate decisions, lower level research support staff and paralegals may be impacted. Moreover, while automation through AI and data technologies may lead to a reduction in jobs for these types of workers, the increase in speed, volume and accuracy gained from this substitution may in turn lead to an expansion of the industry, therefore offsetting this reduction.
- Impacts arising from automation of **complementary tasks**, where AI enhances human decision-making, thus freeing up labour time for other tasks and leading to **higher**

productivity. The automation of menial tasks and workflows can allow workers to instead focus their skills on elements which cannot be replaced by AI, such as legal counsel. For example, in negotiations AI-enabled software could automatically flag issues discovered during contract review and present various options to proceed in case of pushback on negotiation points.

- Impacts arising through the **creation of new work** such as AI architects, Machine Learning engineers and Data Scientists. In the legal, insurance and accountancy sectors, this growth is likely to be felt predominantly in the **emergence of innovative technology startups** creating solutions for the services sector, and **in-house investment into AI and data capabilities** by accountancy firms, law firms, and insurers. These impacts are also driving change in education and training bodies to provide law students with skills applicable for data science, LegalTech and project management.

A 2015 study by Chui et al. (2015) suggests that **45% of all work activities could be automated** (with this figure increasing over the years). Although fewer than 5 percent of occupations could be entirely automated, about 60% of occupations could have over 30% of their activities automated. These technologies could therefore bring significant opportunities for the services sector, by **improving services and making the sector more productive, efficient and competitive**, as well as significant opportunities for UK companies and particularly startups innovating within the AI space.

On the other hand, AI and data technologies can also provide significant benefits to the end-users, through **transforming the way businesses interact with their customers** as well as the **personalisation of products and services**. For example, AI has provided enhanced personalisation and efficiencies for consumer-facing processes and have therefore allowed disruptive firms using these new technologies to enter the market.

One such example is customer engagement in the insurance industry. Customer satisfaction within the insurance industry has been steadily decreasing (*UK Customer Satisfaction Index, 2020*). InsurTech firms such as Spixii are attempting to solve this problem by utilising the powers of AI and data to provide a better customer experience. Spixii is an AI-enabled chatbot that makes it easier for customers to engage with their insurers.

Granted, not everyone wants to talk to a chatbot, and personal engagement with customers is likely to remain important in the near future. Nevertheless, solutions such as Spixii have the potential to add significant value to the customer experience when used in the right way. These include time savings from not having to wait in line for the next assistant; increased flexibility by offering a point of contact 24 hours a day, 7 days a week, 365 days a year; and faster claims processing.

Another example is the rise in offerings of on-demand or personalised insurance, with disruptors such as Caura and ByMiles re-imagining car insurance, and others such as Portabl offering insurance for gig economy workers, which are often not reached by traditional insurance offerings and end-up not insured or underinsured.

AI and data can also help **increase access to services** such as justice, insurance and other financial services. In the legal sector, for example, several innovations have been developed to assist with accessing justice. This includes alternative dispute resolution processes, automatic document processing and case management software. Examples include LegalBeagles, a legal support community offering access to a range of products and services helping users deal with legal issues they are facing; and, LEXSnap, a legal search engine helping users find answers to their family law and immigration questions.

Increased access in the rest of the service sector can, for example, come from AI-enabled assistants which can expedite the process of purchasing financial products (examples of firms providing such app-based and expedited service are UK-based InsurTechs Celo, Homelyfe and Broolly). However, as the Law Society (2019) in its recent access to justice report notes technology alone is not the answer and its use should be coupled with better data management, information sharing and coordination in the sector.

Although examples where AI and data technologies have delivered benefits to services companies are already emerging (some of which are mentioned throughout this report, including in case studies), **the full effects are yet to fully materialise**. Companies, particularly in the service sector, are still investing in, or even have yet to start investing in, adoption of AI and data technologies. As with any advances in technology, it will take a sufficient stock of investment, and implementation time lag, before widespread economic effects of adoption fully materialise.

The proliferation of AI and other data technologies may also lead to further opening and sharing of data. For example, this can arise from companies transitioning from legacy systems, which can cause issues with data access, to newer, cloud-based systems which can support modern processes such as API calls. Data openness carries with it several direct and indirect economic benefits. These benefits can include increases in market size, creation of jobs and greater efficiencies gained within public services.

Previous work by London Economics has mapped the **economic effects of opening data** to new uses and users by removing frictions that impede data mobility (Competition & Consumer Commission Singapore, 2019; Ctrl-Shift, 2018):

- **external benefits arising from increased use of data** (i.e., more data being provided, which may have value that is not reflected in the benefit received by data subjects themselves);
- **higher productivity** (i.e., making it easier to combine data from different sources lowers the cost of producing data-enabled products and services); and
- **innovation** from combining data in new ways across organisations and industry silos.

This **wider economic impact of open data** provides a further significant opportunity for AI and data technologies in the services sector and wider UK economy. For example, a 2015 study estimated that Open data would represent **€325 billion** (£235 million) direct market size for the period 2016-2020, creating a total of **100,000 jobs including 25,000 open data jobs**, and resulting in **7,000 lives saved** due to quicker response and fewer road fatalities (San Chan et al., 2015). Moreover, in an earlier study by Manyika et al. (2013), **the potential annual value of global open data was estimated to be \$3 trillion** (£1.9 trillion), with **\$900 billion** (£575 billion) **value for Europe alone**.

Conversely, **advancement and development of AI can also be enhanced through advances in open data**, with increases in the openness of open environments (of which open data is a component) in turn, having the potential to lead to an increase in innovation of AI technologies, attracting new talent and increasing the level of collaboration across these industries (Barbuta, 2019).

Engine B: Transforming professional services for the digital age by creating open standards



Who are Engine B?

Engine B were established in 2019 with the aim to create common data standards for the audit, tax and legal industries. They were born from a project originating within KPMG.

What does Engine B offer?

Issues around data access are a significant barrier to unlocking the potential of AI. Data is often kept in legacy systems or 'data silos', making extraction costly and adoption of AI difficult. A lack of common standards further means different solutions are often not interoperable.

Engine B have set out to solve this challenge by creating common data models and standards across the audit, tax and legal services similar to the Open Banking for Corporate Data. Using feedback gained from client engagement, these will be published as open source standards with the goal of serving as a foundation for the creation of common data access and analysis tools.

What stage of the journey are Engine B currently at?

Engine B have already created a common data model for the audit industry and are currently working on models for the legal and tax industries. Engine B has so far raised £3.5 million from different sources including support from the ICAEW and Microsoft, and a recent award of £1.7 million funding through Innovate UK's Next Generation Services programme, where Engine B, in collaboration with Oxford University, developed one of four winning proposals in the Innovation Lab focusing on Enabling Data Access.

■

Source: London Economics based on an interview with Shamus Rae (CEO and founder of Engine B) and Engine B awarded £1.75m Innovate UK industrial research award. Available at: <https://www.businessleader.co.uk/engine-b-awarded-1-75m-innovate-uk-industrial-research-award/83356/> [accessed 22/04/2020] Picture credits: Pictures courtesy of Engine B.

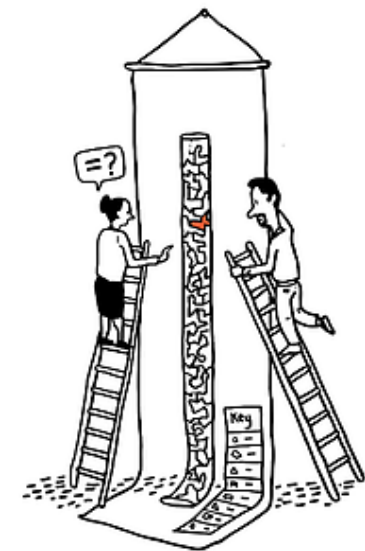
What are the implications for industry?

Competitive pressure means incumbents are likely to increasingly see their margins being squeezed. Unlocking the potential of AI and data will be a vital way to increase efficiencies and remain competitive over the medium term; alleviating data access and interoperability barriers will be key to unlocking this potential.

An industry-wide move towards open standards will not only improve the efficiencies for incumbent firms but will also provide benefits for smaller firms towards the tail end of the industry who rely on using third party software. Third-party software often requires smaller firms to provide their own data for processing, which can be costly if data is hard to extract and process. The implementation of open standards and common data models will allow these firms to access data at a much lower cost

Key Takeaways

- Failure to innovate combined with increasing competitive pressures is likely to result in a loss of competitiveness in the future. AI and data technologies can help increase efficiencies, but significant data access and interoperability barriers remain. Adoption of open standards and common data models will lower barriers to unlocking the potential of AI and Data technologies and enable greater access to these technologies for smaller firms.



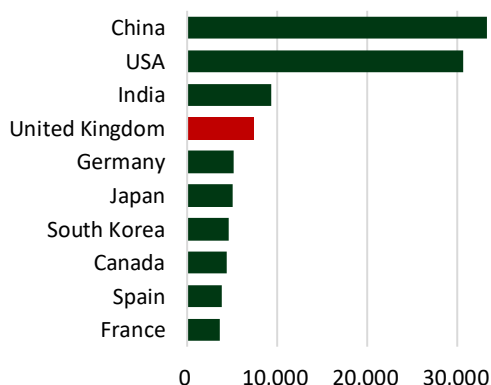
2.3 The UK is well placed to take advantage of the opportunities AI and data technologies bring

As this section will highlight, the UK has a **strong AI and data ecosystem**, with a strong research base, a thriving industry landscape, a strong funding environment compared with other European markets, existing acceleration and incubation initiatives, and a recognition by Government of the importance of AI and data. Together, these factors place the UK among the leading AI and data ecosystems worldwide.

Excellent research base

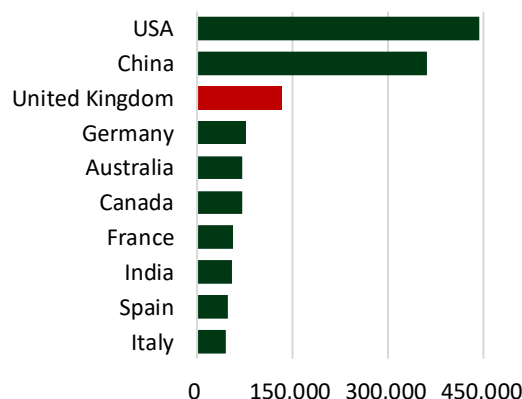
The UK's AI and data research base is excellent, with the UK already seen as a world leader in artificial intelligence (HM Government, 2017). The **UK ranked fourth in terms of the number of publications in AI research** between 2015 and 2018 (Figure 2), behind China, the United States and India, and **third in terms of number of citations** (Figure 3). Indeed, when accounting for population size it is obvious that the UK significantly punches above its weight with approximately 200 publications per 100,000 people compared to 136 and 26 publications per 100,000 people for the United States and China, respectively².

Figure 2 Number of AI publications between 2015 and 2018



Source: London Economics; Data source: Artificial Intelligence Index Report 2019 / Microsoft Academic Graph

Figure 3 Number of AI citations between 2015 and 2018



Source: London Economics; Data source: Artificial Intelligence Index Report 2019 / Microsoft Academic Graph

The UK's strength in research is also highlighted by the survey undertaken for this study (see Figure 4 and Figure 5), with **85% of survey respondents agreeing that research is a key UK strength in AI and data for the services sector**. **91% further saw research as fundamental to AI and data innovation in the services sector**.

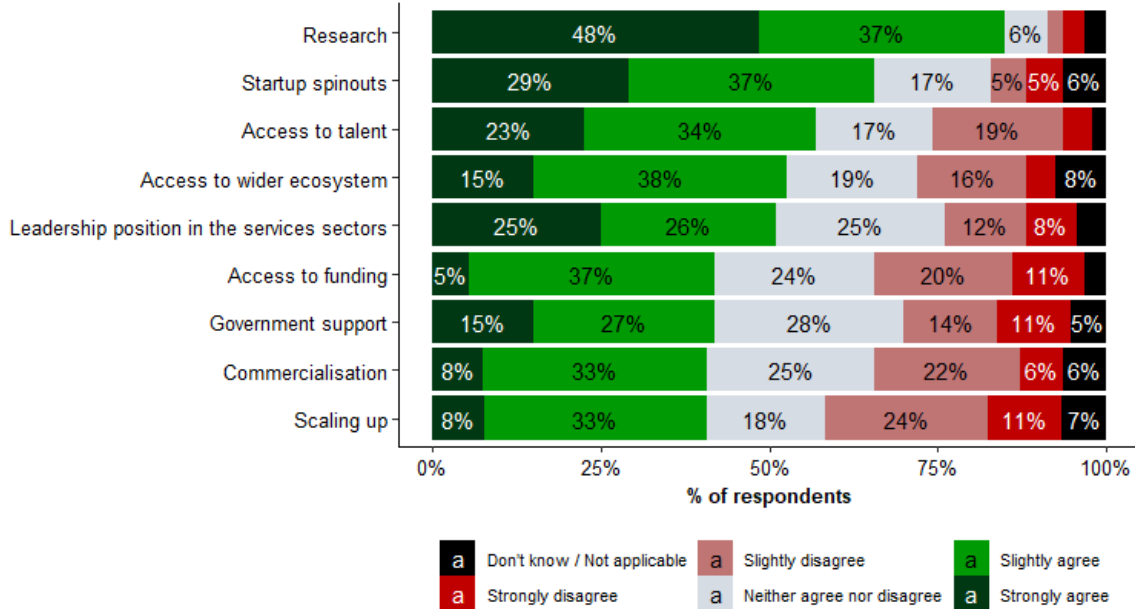
However, while 67% agreed that research filters through to applications in the services sector, the survey results suggest that **translating research into commercial products and services as well as scaling up are areas where the UK could do better**. This is mirrored by respondents' opinions of key drivers of innovation (see Section 4.2), where research spun out by universities was also seen as less of a driver of innovation within AI.

² Based on latest available population data (for 2018) from the World Bank.

Around 54% agreed that it is difficult to access knowledge and to find the right partners within UK universities.

Figure 4 UK AI and data strengths as seen by survey respondents

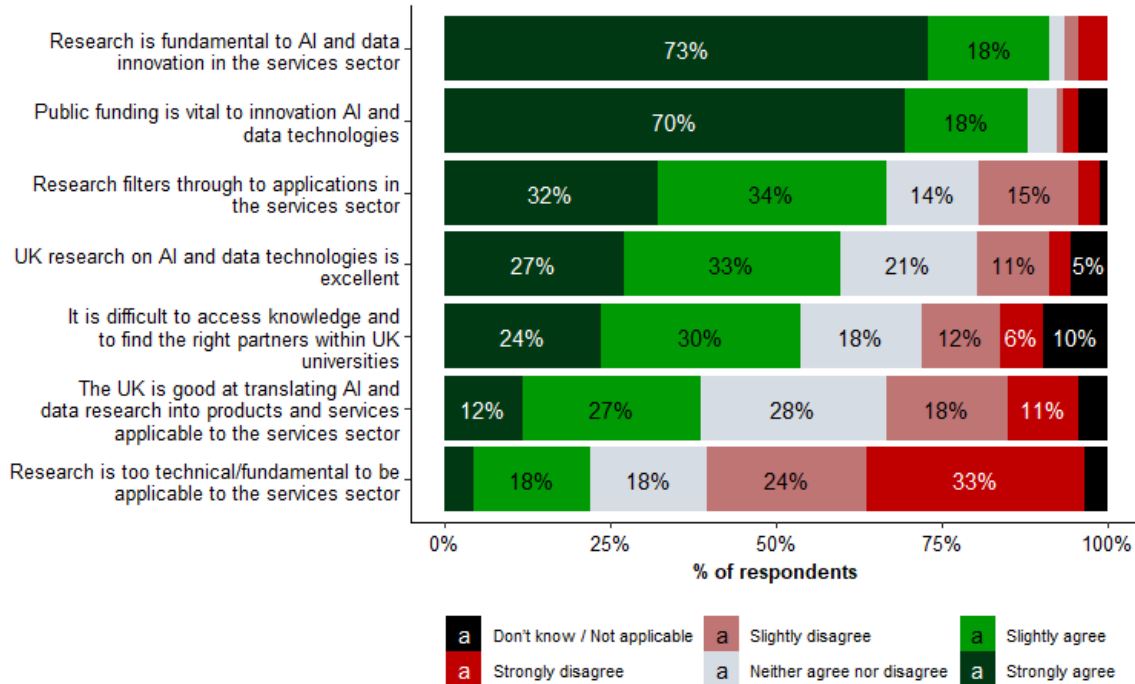
In your opinion what are the key UK strengths in AI and data for the services sectors?



Note: No. of responses between 91 and 93. Source: London Economics

Figure 5 Survey respondents' views on AI and data research among UK universities

Thinking about AI and data research among UK universities / institutions, do you agree with the following statements?



Note: No. of responses between 91 and 93. Source: London Economics

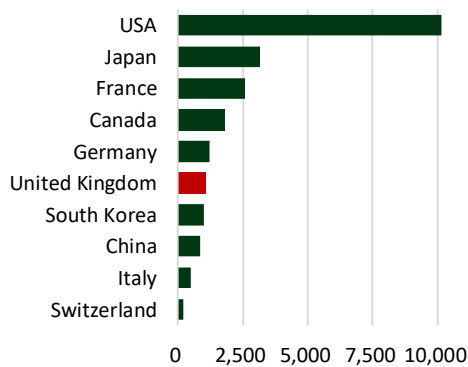
Thriving industry landscape

In addition to a strong research base, **the UK is home to many companies developing and using AI**, some of which are among the world's most innovative. This includes subsidiaries of **major players** such as IBM and Microsoft and **a thriving landscape of startups and SMEs** (Hall & Pesenti, 2017).

While it is difficult to put a precise figure on the number of UK AI companies, figures obtained from the Crunchbase database suggest that the number is at least 1,100³. Moreover, with 758 companies, London has an AI supplier base double the size of those in Paris and Berlin combined (CognitionX, 2018).

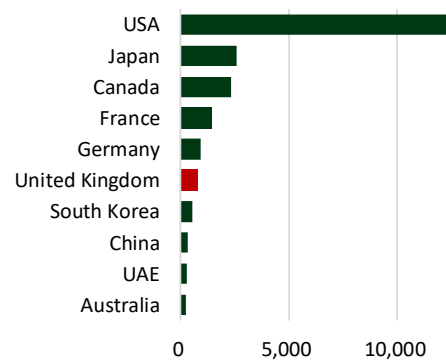
This is reflected by the number of patents on AI technology, which provide a measure of AI activity in industry, with the **UK ranked sixth in terms of both the number of patents** (Figure 6) **and the number of patent citations** (Figure 7). Nevertheless, it should be noted that while the UK is leading in AI and data research publications within Europe (Figure 2), the UK lags behind France, and to a lesser extent Germany when it comes to patents.

Figure 6 Number of AI patent publications between 2015 and 2018



Source: London Economics; Data source: Artificial Intelligence Index Report 2019 / Microsoft Academic Graph

Figure 7 Number of AI patent citations between 2015 and 2018



Source: London Economics; Data source: Artificial Intelligence Index Report 2019 / Microsoft Academic Graph

In the services sector, the UK already has a **well-established and thriving fintech cluster**, with more than 1,600 FinTech firms, a number that is expected to more than double by 2030, employing over 76,500 people and generating a revenue of £6.6 billion pounds, and the sector having received \$3.3 billion (£2.5 billion) of VC, PE and CVC investments in 2018 (DIT, 2019).

While AI and data technologies in other services sectors are less mature compared to the UK's fintech sector, there has been **significant growth in the use of AI & data across the services sector**.

The UK already has an **active InsurTech market** with hundreds of InsurTech startups (InsurTech Channel, 2019). This is highlighted by examples of leading InsurTechs including Gryphon Group, who are creating a cloud-based consumer protection business and have raised £180 million since inception; Zego, who provide simple and flexible policies to enterprises, and have raised £39.6 million; and Bought by Many, the first UK pet insurer to offer online form-free claims, who have raised £22.5 million in total.⁴

³ Search conducted on 26th May 2020 for UK headquartered companies in the 'Artificial Intelligence' or 'Machine Learning' industries.

⁴ See Grones, G. (2020), from which this data was obtained, for a fuller list of the Top 20 InsurTech companies, by funds raised, in the UK.

Similarly, the UK already plays a **significant role in the global LegalTech segment**, with London among the leading emerging LegalTech centres worldwide. Moreover, legal tech innovation (as well as innovation in the other segments) is also taking place in other parts of the UK. For example, The Law Society (2019) identified Belfast as one of 10 emerging lawtech scenes globally, alongside London, Hong Kong, Singapore, San Francisco, Toronto, Atlanta, Madrid, Tel Aviv and Kuala Lumpur.

The strength of the UK LegalTech sector is highlighted by the success of AI document analysis firm Luminance, who have raised \$23 million in funding overall since their founding in 2015 and now count several of the world's top law firms as their clients; Ravel Law, who offer computer-assisted legal research and raised over \$15 million in funding since being founded in 2012 and were subsequently acquired by LexisNexis; and, Tessian who use AI to protect law firms from data breaches and have raised a total of nearly \$59 million since their foundation in 2013.⁵

As will be highlighted later in the report, the UK's (and indeed the global) AccountTech segment is less active. Nevertheless, high growth UK startups such as The Accountancy Cloud, Crunch, and My Digital Accounts have also emerged in this segment.

The UK has several **geographical AI and data clusters**. A clustering analysis, undertaken by Forth, T. et al. (2018), of the number of businesses, events, and papers, identified 35 AI and data clusters across the UK. Unsurprisingly, **London was identified as the largest cluster**, comprising over **27%** of the total AI and data related activities in the UK.

Nevertheless, the study also identified significant AI and data clusters outside of London, such as **Brighton, Cambridge, Southampton, Portsmouth, Oxford** and **Bristol**, in the South, around **Birmingham** in the Midlands, and around **Manchester, Liverpool, Leeds, Sheffield** and **Newcastle** in the North as well as around **Edinburgh** and **Glasgow** in Scotland. (see Figure 8)

Strong funding environment

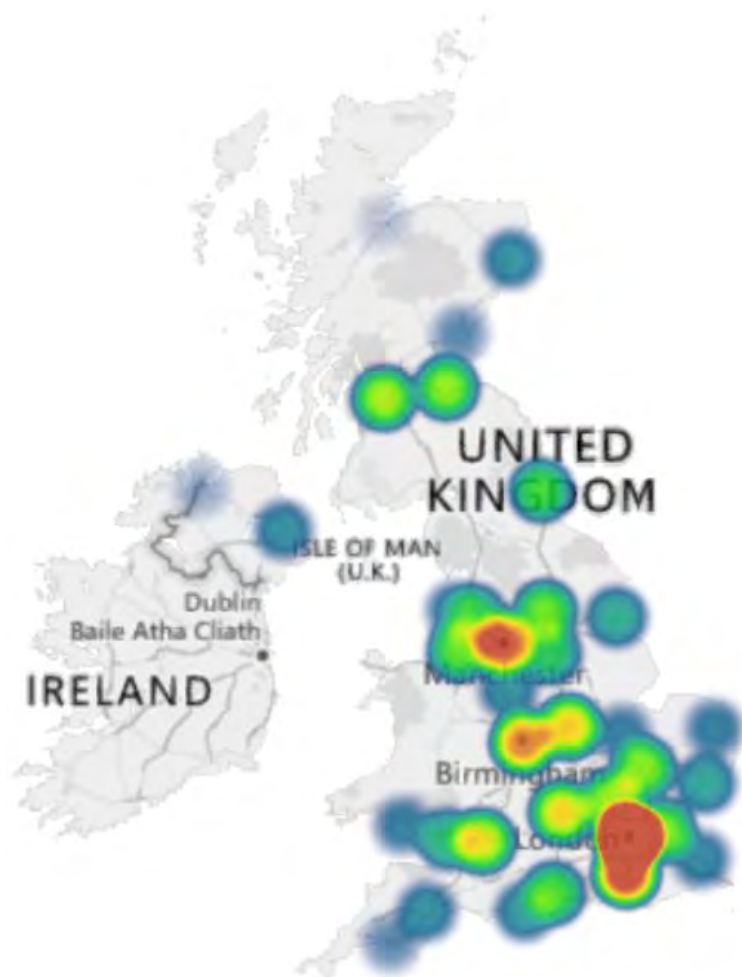
The UK also has a **strong funding environment compared with other European markets**, with the UK ranking eighth in terms of private investment in AI in 2018 per million of GDP and UK AI companies having received the most funding in 2018 and 2019 outside of the USA and China. (Figure 9) While the UK clearly lags behind the US and China in terms of total investment, the difference is less striking considering that the Chinese and US economies are approximately 5 and 7.5 times larger, respectively, than the UK's economy⁶. Indeed, compared to most other European countries the UK's Venture Capital (VC) market is highly developed and mature (British Business Bank, 2020).

Nevertheless, the UK's VC eco-system has historically been under-performing relative to the US in the sense that Venture Capital-supported firms in the UK received fewer follow-on rounds and the size of the follow-on rounds was smaller than in the US. Moreover, UK Venture Capital investors also appeared to exit their investments at an earlier stage compared to investors in the US. While the gap has been narrowing in recent years, with UK firms now able to receive subsequent funding rounds with a broadly similar frequency to their US counterparts, a significant gap in terms of the size of the average deal remains (British Business Bank, 2017, 2018, 2019, 2020).

⁵ Based on data obtained from Crunchbase as of August 2020.

⁶ Based on most recent World Bank GDP data for 2019.

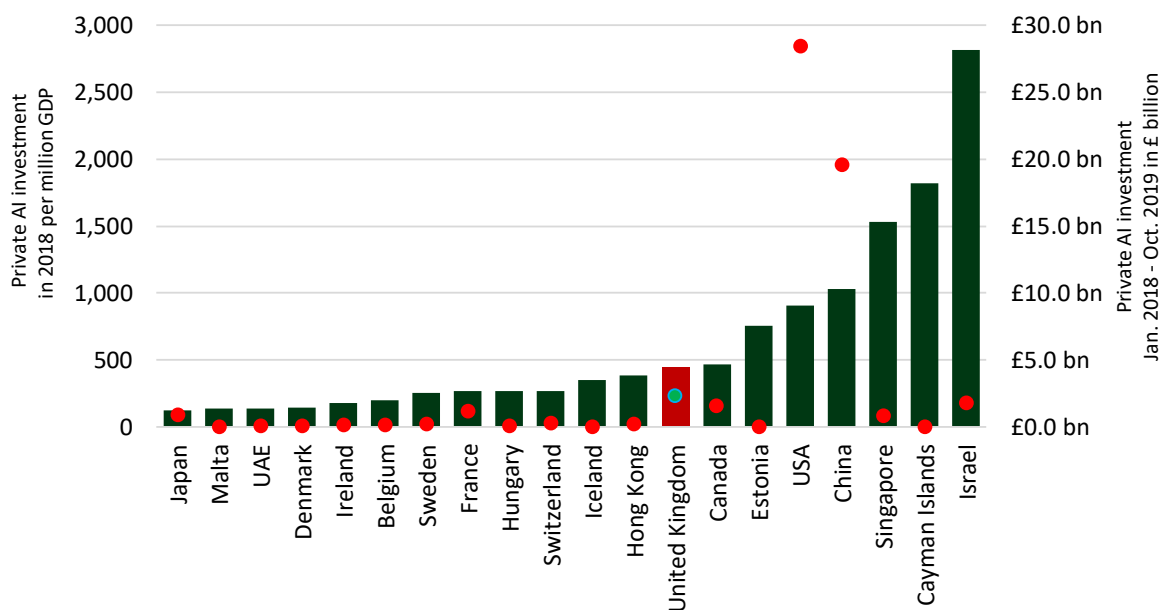
Figure 8 AI and data clusters across the UK



Note: Map created by LE using data from The Data City. Scores represent the proportion of the UK's total ecosystem and so sum to 100. Scores represent the absolute size of the cluster. Therefore, bigger places score higher just because they're bigger. Experimental scores divided by population are available from The Data City upon request. For further methodological information, consult The Data City (2018).

Source: UK Tech Innovation Index 2 and The Data City, The Data City (2018)

Cluster	Score	Businesses	Events	Papers
London	27.1	16.7	5.7	4.6
Brighton, Aldershot, Worthing, Crawley, Slough	6.9	4.3	0.6	2.1
Manchester, Burnley	6.1	2.4	0.8	2.8
Birmingham, Coventry	5.3	2.8	0.9	1.7
Leicester, Nottingham, Derby	4.2	1.6	0.8	1.8
Oxford, Swindon, Reading	4	2.5	0.4	1.2
Bristol, Gloucester	3.7	2.1	0.4	1.1
Glasgow	3.3	1.2	0.8	1.3
Luton, Northampton, Milton Keynes	3.2	2.4	0.3	0.5
Edinburgh	3	1	0.8	1.2
Cambridge UK	2.9	1.5	0.4	1
Basildon, Chatham	2.8	2.6	0.2	0
Leeds, Bradford, Huddersfield, Wakefield	2.7	1.8	0.3	0.6
Liverpool, Birkenhead	2.6	1.5	0.4	0.8
Southampton, Portsmouth	2.4	1.4	0.2	0.8
Newcastle, Sunderland, Middlesbrough	2.3	1	0.3	0.9
Sheffield, Barnsley, Mansfield, Doncaster	1.9	0.9	0.2	0.8
Preston, Wigan, Warrington, Blackburn	1.7	1	0.5	0.2
Cardiff, Newport	1.6	0.9	0.2	0.5
Hull, York	1.3	0.5	0.4	0.4
Ipswich	1.2	0.8	0.1	0.4
Bournemouth	1	0.8	0.1	0.1
Belfast	0.9	0	0.3	0.5
Stoke, Telford	0.9	0.6	0.2	0.1
Aberdeen	0.9	0.3	0.1	0.5
Exeter	0.9	0.6	0.1	0.2
Canterbury, Ashford, Folkstone	0.8	0.6	0.1	0.1
Blackpool	0.8	0.3	0.1	0.4
Norwich	0.7	0.4	0.1	0.2
Peterborough UK	0.7	0.6	0.1	0.1
Swansea	0.7	0.3	0.1	0.3
Plymouth UK	0.5	0.3	0.2	0
Dundee	0.5	0.2	0.1	0.1
Londonderry, Derry	0.3	0	0	0.2
Inverness	0.2	0.1	0.1	0

Figure 9 Private investment in AI (£ bn, 2019 prices)

Note: Bars represent private AI investment in 2018 per million of GDP; dots represent private investment in AI between Jan. 2018 and Oct. 2019 in £ bn. Data obtained from the Artificial Intelligence Index Report 2019. Original data reported in billions of current US\$ and converted into Sterling using the Bank of England average annual exchange rate for 2019. 2018 GDP data obtained from the World Bank.

Source: London Economics; Data source: Artificial Intelligence Index Report 2019 / CAPIQ, Crunchbase, Quid, 2019s

In the services sector, the InsurTech market has seen over £750 million (\$1 billion) in investments through 2018 (InsurTech Channel, 2019). In the legal segment, the UK is already home to more than 269 private tech companies impacting the legal industry and backed by £430 million in capital investment. (Cross, 2019; The Law Society, 2019)

While specialised funders in AccounTech, LegalTech, and InsurTech are currently rare in the UK, a number of institutional funders focusing on AI and data technologies as part of their wider portfolios have been identified. A non-comprehensive list of identified funders is provided in Annex 4.

Despite the UK's strong funding environment compared with other European markets, survey results and consultations highlighted that **access to funding, as well as accessing talent and the wider ecosystem, are all areas where the UK still has scope for improvement**. While around half of respondents agreed that these were areas of UK strength, a significant number of respondents also disagreed (see Figure 4). Moreover, accessing talent and funding were also identified as key challenges to adoption of AI and data as well as for AI and data startups/SMEs (see Section 4.3).

Existing acceleration and incubation initiatives

A number of **accelerators and incubators already exist to help innovators** in the insurance, accountancy and legal services sectors succeed. These include specialised independent accelerators, such as the InsurTech Gateway; specialised accelerators that have been set-up by incumbent players, such as Barclays' Notting Hill Gate Eagle Lab, Lloyd's Lab, AXA Next or PwC Scale Programmes; as well as accelerators focusing on AI and data more widely, such as Founders Factory and Data Pitch.

Moreover, some universities also have their own accelerators. While these are not usually focused specifically on tech in the services sectors, or even on AI or data, they are a natural first point of contact for innovative spin-outs in the services sectors.

A non-exhaustive list of identified accelerators and incubators is provided in Annex 3.

Recognition of importance of AI and data within Government

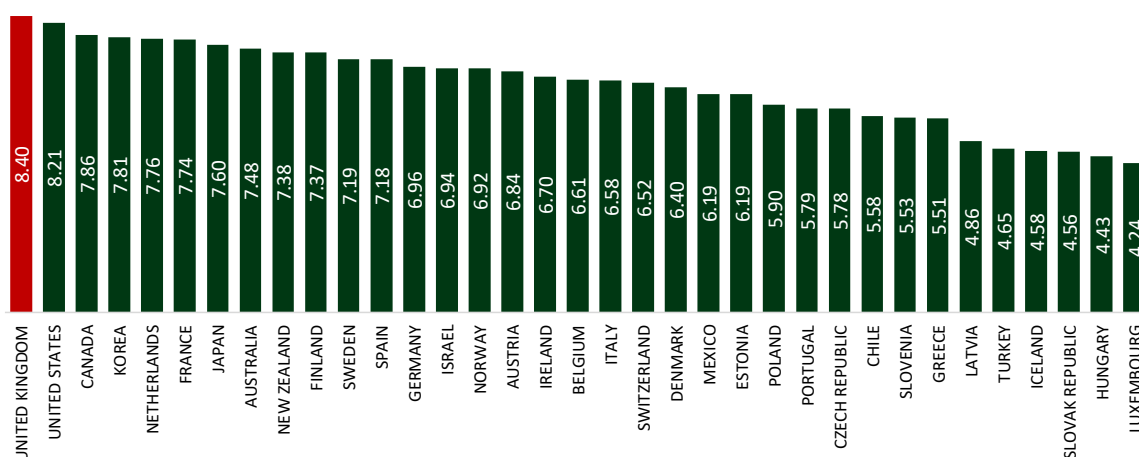
This strong AI and data ecosystem provides a strong foundation for continued innovation in the services sector. Moreover, the increasing **importance of AI and data technologies is also recognized by the UK Government**, which, in 2017, set growing artificial intelligence (AI) and the data driven economy as one of four Grand Challenges for the UK Government and wider UK economy in the UK Industrial Strategy (HM Government, 2017).

The UK Government aims to put the **UK at the forefront of the AI and data revolution** and embed AI across the UK in order to create jobs and drive economic growth. This is reflected in the UK Government's standing in terms of AI internationally, with the **UK ranked first in Oxford Insights' Government AI Readiness Index**, followed by the United States, Canada, and Korea (Stirling et al., 2018, Figure 10). The index provides an estimate of how prepared a country's government is for implementing AI in public service delivery. It takes into account nine factors: technology skills available in the workforce, availability and quality of data, digitisation, AI startups, innovation and government effectiveness, and digital public services.

For the services sector specifically, the UK has, through its Next Generation Services Challenge allocated, £20 million of funding, between 2018 and March 2021, to projects exploring how new technologies could transform the UK accountancy, insurance and legal services industries (UKRI, n.d.).

Public funding initiatives such as this are key considering that **88% of survey respondents agreed that public funding is vital to innovation in AI and data**. Despite this, only 42% felt that government support was a key UK strength (see Figure 4 and Figure 5).

Figure 10 Government AI Readiness Index



Source: Oxford Insights

3 Market uptake and adoption of AI and data technologies in the UK services sector

AI and data innovation is taking place across the services sector. While InsurTech remains more mature than LegalTech and AccountTech, incumbents across all three sectors are increasingly investing in, and adopting, AI and data technologies. Nevertheless, widespread adoption of AI and data technologies is still low.

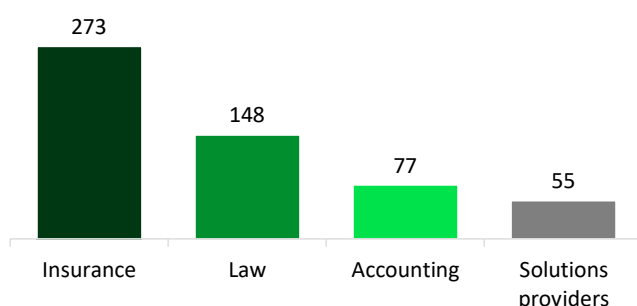
This section provides an overview of the current areas of AI and data innovation within the accountancy, legal and insurance services sectors, and the level of adoption of AI and data among incumbent firms. First, Section 3.1 provides an overview of the AI and data ecosystem in the services sector. Following this, Section 3.2 provides a more detailed discussion for each of the three sectors.

3.1 Size of the AI and data ecosystem in the services sector

The UK is among the leading AI and data ecosystems worldwide (see Section 2.3). London has a strong AI supplier base with CognitionX (2018) having identified more than 750 AI suppliers in the UK. In the analysis undertaken for this report, a total of **553 AI and data companies working in the accountancy, legal and insurance services sectors were identified**⁷.

An analysis of the size of the ecosystem in each of the three segments shows that, currently, the

Figure 11 Sectoral split of identified companies



Note: Solutions providers refers to AI and data solutions for the financial/professional services sector without a specific focus on any one of the three sectors. A small number of companies identified were placed at the intersection of two of the three sectors, these were assigned to the sector that most closely matched their activities to avoid double-counting.

Source: London Economics

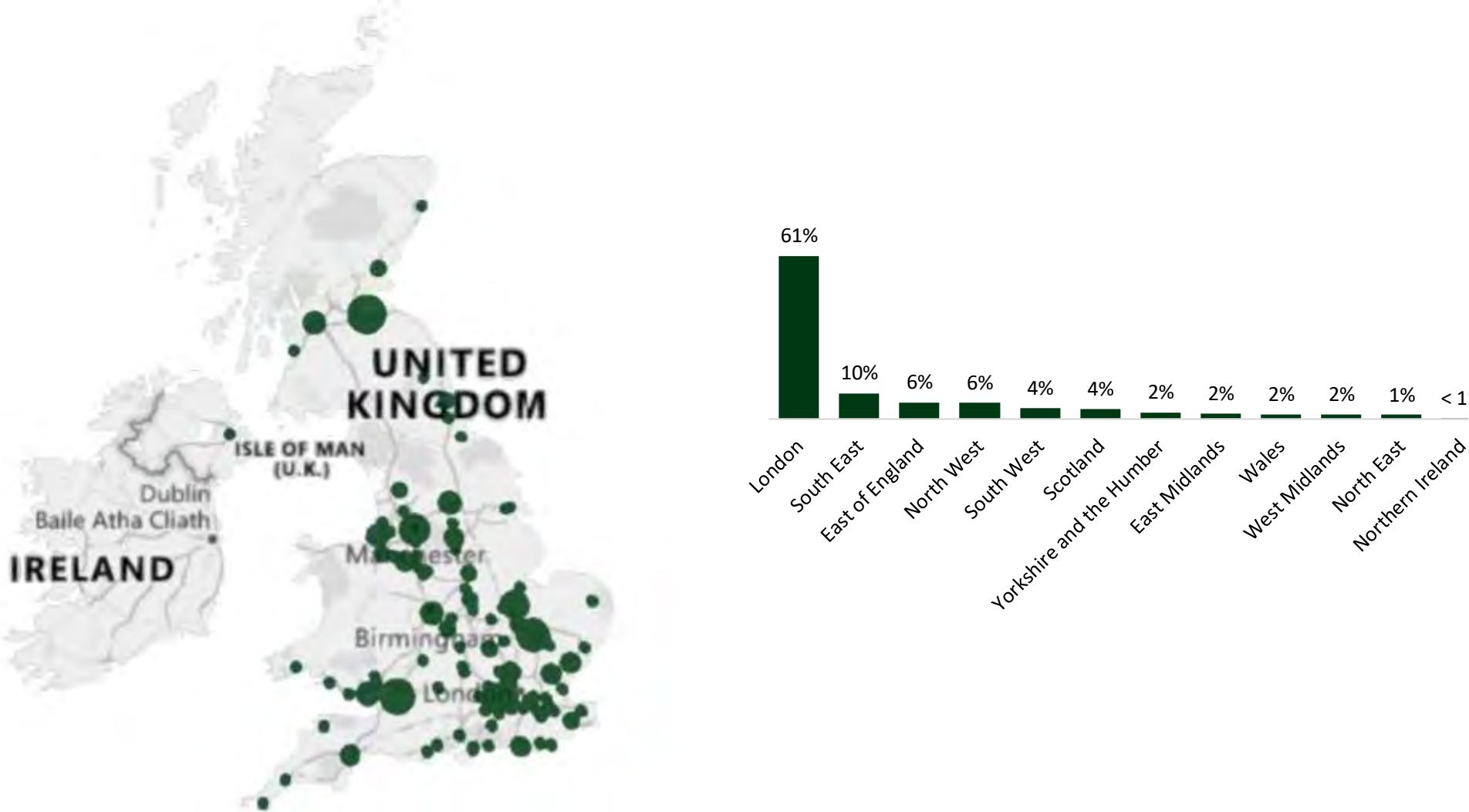
InsurTech segment is the largest, with **InsurTech** firms accounting for **nearly half** of all identified companies. (Figure 11) **LegalTech** companies were significantly less prevalent than InsurTech companies (**27%** of identified companies). The **AccountTech** segment is the least active of the three segments in terms of the number of AI and data startups, with tech firms in this sector only accounting for approximately **14%** of identified companies. Around **10%** of companies identified were companies that provide AI and data solutions for the services sectors, but

without a specific focus on any one of the three sectors.

Similar to the geographic distribution of AI and data firms in general (Section 2), tech firms and startups in the accountancy, insurance and legal services are concentrated in London and surrounding areas, but with considerable clusters identified across the UK, particularly around Bristol, Cambridge, the North West, and around Edinburgh in Scotland. (see Figure 12)

⁷ Sources: Crunchbase, BvD Fame, the Digital Insurer InsureTech Directory, the InsurTech Industry Directory, the Legal Geek Startup Map, and the exhibitor list of Accountex 2020.

Figure 12 AI & data tech firms/startups in the accountancy, insurance and legal services sectors



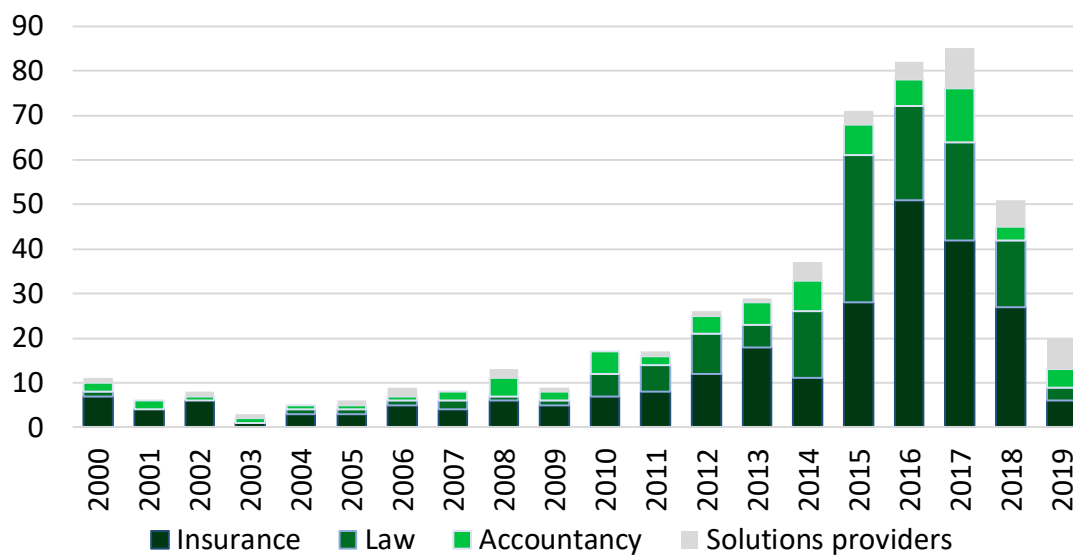
Note: Map excludes companies with headquarters in London in order to avoid scaling issues relative to the rest of the UK.

Source: London Economics

3.1.1 Trends in the services sector

Figure 13 shows the number of identified AI and data tech startup formations in the three services sectors over time⁸. The figure shows that InsurTech is the most established field, with AI and data companies working in the insurance field identified even as far back as twenty years ago. Since then, the field has seen steady growth in the number of players in the field, with growth accelerating around a decade ago. However, startup formation has since peaked in 2016, with recent years showing a slowdown in new InsurTechs entering the space.

Figure 13 No. of UK AI and data tech startup formations over time



Note: Solutions providers refers to AI and data solutions for the financial/professional services sector without a specific focus on any one of the three sectors. Only includes companies identified that are still trading. Therefore, Companies founded that have since stopped trading would not be captured. Therefore, figures for earlier years may be underreported. Data for 2019, and to some extent 2018, is likely to underestimate new company formations due to time lags between company formations and the databases picking up the new firms. *Source: London Economics*

LegalTech is a newer field, with significant growth in company formations only seen post the 2008/09 financial crisis. Similarly, to InsurTech, LegalTech also experienced a sharp peak (in 2015) followed by a slowdown in company formations in recent years.

This slowdown is also observed in other studies of the LegalTech and InsurTech sectors, as well as in the FinTech sector more widely. This suggests that the observed slowdown is not a fragment of the data sources used, but rather points towards a slowing of momentum of tech formations across the services sectors. This may be because of recent economic conditions presenting barriers to entry (as suggested in Legal Geek, 2019) or a shift away from startups towards more established players (as argued by Deloitte, 2018).

Finally, while the AccounTech segment has also experienced growth over the period, the number of AI and data startups working in the accountancy field remains small when compared to InsurTech and LegalTech.

⁸ It should be noted, that this analysis is based on identification of companies currently trading. Therefore, the analysis does not capture companies that were founded over this period but stopped trading. Figures for earlier years may thus be underreported. Moreover, data for 2019, and to some extent 2018, is likely to underestimate new company formations due to time lags between company formations and the databases picking up the new firms.

3.2 Market uptake and applications in the services sector

Adoption of AI and data technologies among UK services firms could bring significant benefits to UK businesses and the UK economy more widely. This is particularly evident, given the importance of the services sector to the UK economy (see Section 2.1). The following sections provide a discussion on the current level of market uptake as well as emerging applications in each of the three services sectors. In order to understand where the potential opportunities of adoption in the legal, insurance and accountancy services sectors may lie, it is important to take the market structure of the sectors into account. Therefore, the discussion for each sector is preceded by an overview of the market structure of that sector.

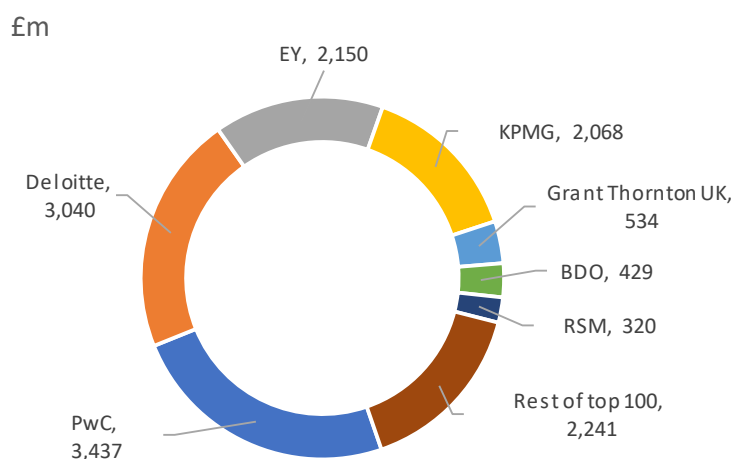
As this analysis shows, all three sectors are heavily dominated by a number of large players who account for a significant proportion of the GVA generated within each sector. Therefore, significant adoption among large players will have the biggest direct impact on UK GDP. On the other hand, adoption by mid-sized or smaller firms, as well as the emergence of disruptive new entrants, may challenge incumbent firms and, over the medium term, has the potential to significantly shift the market structure of the three services sectors should incumbents fail to adopt.

3.2.1 Accountancy sector

Market structure

For the **accounting sector**, there were around 5,660 registered audit firms in the UK at the end of 2017, with total accounting services procured by industries across the UK worth approximately £17.7 billion in 2017. The top largest 100 accountancy firms received approximately £14.2 billion in fee incomes during 2016/17, thus accounting for the vast majority of income in the sector. Moreover, 75% of the fee income of the top largest 100 firms were claimed by the Big 4 accounting firms.⁹

Market shares of largest accounting practices, 2016-17



Source: Oxford Economic (2018). *The accountancy profession in the UK and Ireland, based on Accountancy Age*

⁹ Oxford Economic (2018). *The accountancy profession in the UK and Ireland*

Smith & Williamson: Investments in technology are key to supporting client service



Who are Smith & Williamson?

Smith & Williamson (S&W) is one of the ten largest accountancy firms in the UK¹, employing over 1,800 people. S&W also run an investment management and advisory business, with around £22.4 billion of funds under management².

What is Smith & Williamson's relationship to AI and data technologies?

S&W have a strong company-wide commitment to AI technologies. This is manifest in both their investment products and their internal operations. S&W is currently undertaking a multi-year investment programme to upgrade their technology to deliver 'future fit' digital capability and ability to scale. For S&W, this is a key enabler to improving client service and providing their people with more time to focus on client relationships.

Within S&W AI plays a key role in helping to manage S&W's investment funds business. Together with Orbit Financial Technology, a text analytics and AI computing company, S&W built their own platform, which uses tools such as natural-language processing, OCR, and translation tools to sift through large amounts of qualitative data to identify business characteristics. In addition, S&W also use technologies such as Robotic Process Automation (RPA) tools in the firm more widely. RPA tools allow users to configure a 'software robot' to capture, interpret and perform tasks that are repetitive, error-prone, rules based, or time critical. Within S&W, RPA tools are used for a range of tasks such as managing tax returns and removing errors in administrative data.

In addition to internal use, S&W, in 2017, launched their AI fund, an investment fund, which invests primarily in equity and equity-related securities issued by companies that are engaged with AI. Moreover, S&W's dedicated technology team also directly works with technology companies providing advice on a wide range of business challenges.

What needs to happen for the sector to reap the benefits of AI?

While accountancy firms are increasingly exploring AI and some are actively using these and other data technologies in their business activities, there are also many firms which have not yet used any AI at all.

For Chris Ford, Partner at S&W, the challenge for AI adoption is not in financing or the scale of development needed. Chris points out that investments in AI need not be expensive if you are running a good business with good processes. While developing your own technology may be costly, many tools now exist that can be found cheaply or even for free; allowing companies to rapidly accrue benefits in short periods of time. However, if you have bad business processes these will not be helped by AI.

Chris therefore highlights that change needs to happen at the organisational level: "The stereotype of IT not being integrated has to change. There is a requirement to educate and there needs to be a change in organisational culture so that IT and data has representation at board level, and that all board members are well versed with these technologies."

Key takeaways:

- Accruing benefits of AI need not cost a lot of money or require lengthy projects; free or cheap solutions that can deliver first benefits quickly are already out there.
- To reap the benefits of AI, ownership and commitment to AI and data from a senior level are critical. AI is a general-purpose technology, rather than an application. Therefore, it is creative management that enables AI to generate value across the business.
- Business processes need to be suited to AI; if processes are not right re-designing may be required to be able to reap the benefits.

Source: London Economics based on an interview with Chris Ford, Partner at Smith & Williamson; (1) According to Accountancy Age Top 50+50 2019; (2) as of 30 September 2019.

Applications

The AccounTech segment was identified to be the smallest and least mature of the three services segments examined in this study, with more than three times as many InsurTech companies and nearly twice as many LegalTech companies identified (see Section 3.1).

Examining the data more closely reveals that a significant proportion of the innovation within the AccounTech sector is focused on accountancy software for businesses and consumers. Within accountancy software, innovation appears to be focused on cloud accountancy software and other online or app-based solutions, but also on integration with other business platforms.

Cashflow management, invoicing and expense management solutions, as well as business management solutions were also identified as areas where significant innovation appears to be taking place. The former includes automated data entry, real-time processing of invoices and expenses, but also cashflow management and prediction tools. Business management mostly includes document, workflow, and practice management solution, helping to improve or automate workflows and routine tasks.

Finally, a number of more specific solutions focused on tax and payroll services were identified.

The ecosystem category includes AI and data consultancies focused on accountancy, analytics and intelligence software for accountants, as well as comparison sites and other solutions deemed part of the wider ecosystem that did not fit in the other categories.

Figure 14 AI and data companies in the accountancy sector, by segment



Source: London Economics

Market uptake

Within large accountancy firms itself adoption of AI is far more advanced than suggested by the maturity of the AccounTech scene. All of the Big 4 accountancy firms (KPMG, Deloitte, PWC, EY) already use AI, for example, to extract information from documents, to detect anomalous events, assess compliance, or to help them make informed decisions when providing advice to customers (Faggella, 2020).

Indeed, the Big 4 are far ahead of their law counterparts, and to some extent insurers, in terms of AI adoption. Moreover, since changes in regulations allowed non-legal firms to enter the legal scene, the Big 4 have increasingly started to invest in LegalTech and indeed compete with legal firms. This is highlighted, for example, by the acquisition of Riverview Law, a legal practice with a focus on technology and automation, by EY in late 2018, and the more recent acquisition of Thomson Reuters Pangea3 legal managed services business¹⁰.

Over the past few years, a number of studies have made predictions about the increasing automation of accounting. For example, only a couple of years ago, there was a growing belief that by 2020, or soon thereafter, labour-intensive tasks such as tax preparation, payroll, audits and banking will be fully automated. (John Stokdyk, 2019)

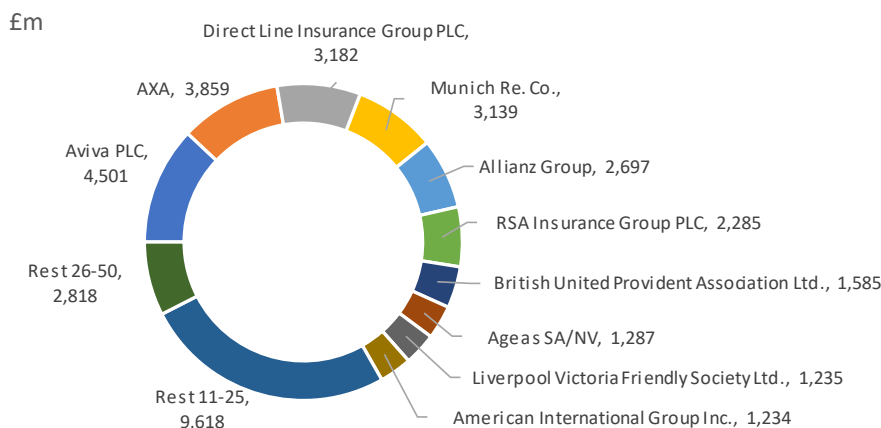
However, in reality adoption of AI and data outside of the Big 4 varies. Most large accountancy firms are either using AI in some form or have at least experimented with AI and data technologies. Indeed, in response to a 2019 survey by Thomas-Bryant (2019), more than a third (35%) of accountants surveyed regarded their firms as early adopters of technology that invested ‘readily in the best technology available in order to stay ahead of competitors and diversify their offerings’. Moreover, 58% agreed that they would use some form of AI within the next three years to help them automate tasks and improve the way that they run their businesses. While these figures show that some of the predictions made over the last few years are slowly taking shape, they also highlight that the accountancy sector is not there yet.

3.2.2 Insurance sector

Market structure

The UK has the largest **insurance** industry in Europe. There were 872 general insurers in the UK in 2018, 281 of which were UK authorised with the remainder headquartered in another European country. Total premium income across life and non-life insurance, in 2017, stood at approximately £283 billion (ABI, 2018). Life insurance made up the largest proportion of premiums written, with the non-life segment accounting for approximately £66.9 billion of net premiums earned in 2017 (Bank of England, 2019).

Figure 15 Non-life insurance premiums written by largest insurers, 2017



Source: S&P Global: *Growing UK Nonlife Insurance Market Faces Tough 2019*

¹⁰ See Rutter Pooley (2019) for more information on the Big 4’s legal strategies.

The 50 largest insurers accounted for approximately £37.5 billion of net premiums written in 2017, with Aviva being the largest non-life insurer. The top 5 insurers accounted for nearly half (46.4%) of non-life premiums written by the 50 largest insurers, while the top 10 accounted for approximately two-thirds (66.8%) of premiums by the 50 largest firms.

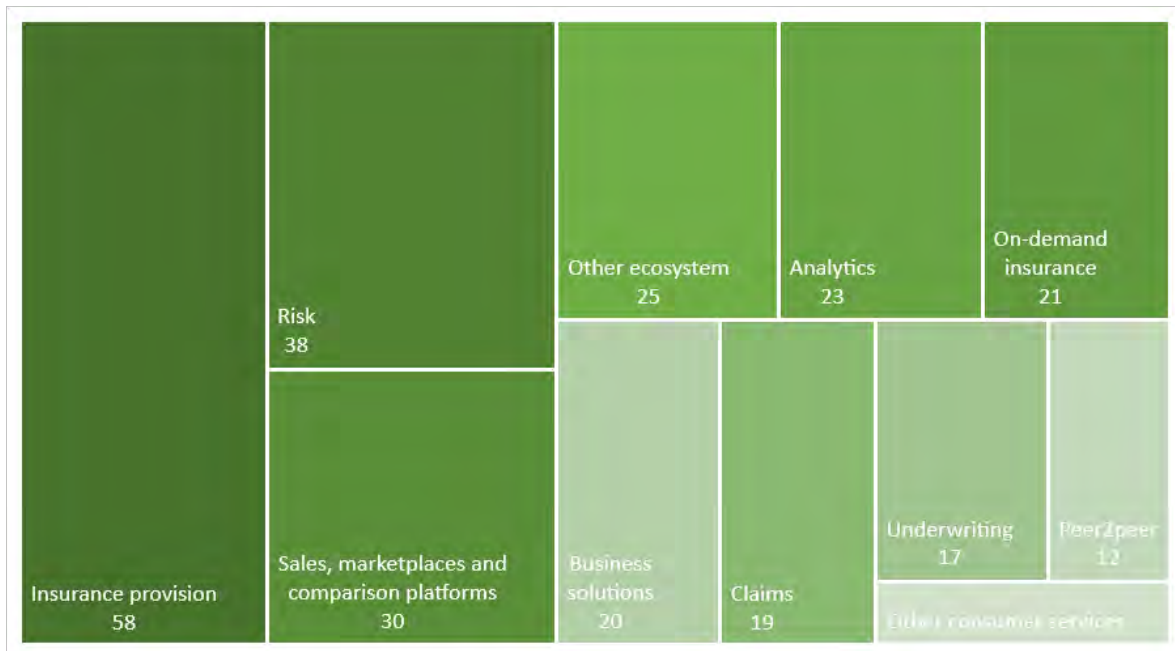
Applications

The AI and data ecosystem in the insurance sector is the most mature out of the three services sectors examined in this study (though the segment remains less mature than its FinTech brother). InsurTech startups account for nearly half of the companies identified in the accountancy, insurance and legal services sectors (see Section 3.1).

Figure 16 shows that a significant proportion of identified AI and data companies in the insurance sector are using AI and tech to offer insurance products. Many companies identified are focused on using AI and data to provide a more consumer focused, personalised, or simpler service, compared to ‘traditional’ insurance services; or are focused on particular niches such as insurance for freelancers or young drivers, cryptocurrency insurance, drone insurance, among others. On-demand insurance solutions, and, more recently, peer2peer solutions have also gained popularity among InsurTechs. Therefore, these are shown as separate categories in Figure 16.

One interesting trend in insurance provision is the rise of Internet of Things (IoT) sensors enabling personalised insurance pricing. A well-known example of this are telematic sensors placed in a drivers’ car providing the insurer insights on the driving behaviour: safer drivers are rewarded by paying lower premiums while risky drivers face higher premiums. Taking this idea one step further and combining it with the rise of on-demand insurance, some companies (e.g. By Miles, insurethebox) now offer car insurance charged by the mile. Another interesting example is flood insurance, where IoT sensors can be used to provide property level flood data, automatically triggering a claim if the sensors detects unusually high water levels (e.g. Flood Flash).

Figure 16 AI and data companies in the insurance sector, by segment



Note: Other ecosystem covers companies that did not fit in any other category, such as AI and data consultancies focused on the insurance sector. Further details on a large number of InsurTechs can be found in the [Digital Insurer InsureTech Directory](#), and the [InsurTech Industry Directory](#). Source: London Economics

Cytora: Transforming the future of underwriting



Who are Cytora?

Cytora is an InsurTech that aims to transform underwriting for commercial insurance using Artificial Intelligence and Machine Learning techniques.

The team was spun out from the University of Cambridge in 2014 and has since partnered with global insurers such as QBE, Starr Insurance Companies & AXA XL.

What does Cytora offer the Insurance industry?

Cytora was one of the first firms to attempt to improve the underwriting process using AI and data technologies. Today, Cytora provides an easy-to-integrate platform which automates, and improves the accuracy of, underwriting, distribution and portfolio management for commercial insurers.

Cytora utilises ML and AI to provide insurers a more comprehensive, data-rich and accurate platform to underwrite risk. For example, if an insurer was looking to underwrite a restaurant, Cytora can provide information about the history of loss, location, the owner, the revenues, and other potential rating factors. The information advantage gained from this increase in data can drastically impact underwriting decisions; the focus of implementing this tech for Cytora is not to simply automate and reduce costs, but to help underwriters make better decisions, to perform tasks with better quality and accuracy, and to increase overall productivity.

Source: London Economics based on an interview with Aeneas Wiener (CTO and co-founder of Cytora) and Cytora: closing the knowledge gap. Available at: <https://www.digitalinsuranceagenda.com/78/cytora-closing-the-knowledge-gap/> [accessed 08/04/2020]

What stage of the journey are they currently at?

In 2017, Cytora raised £5.9 million (\$7.6 million) in series A funding; this included funding received from Cambridge Innovation Capital, which Cytora had access to as part of the Cambridge Cluster. In early 2019, Cytora raised a series B of £25m (\$32 million), led by EQT Ventures. Cytora has worked with both large international insurers, and newer technology-focused startup insurers, using their platform.

What can other innovators learn?

When establishing partnerships with insurance firms, Aeneas Wiener (Co-founder of Cytora) noted that while a lot of firms sought to innovate using AI, the most meaningful relationships resulted from partnering with firms who sought to integrate AI into their real insurance operations; as opposed to those that use AI in a side-project, separate from their main business processes.

Cytora believes that if insurers want to remain competitive and reap the gains from AI and ML, they must invest in modern technologies that allow for easy data extraction (such as cloud systems); the availability of data in a clean form is seen by Cytora as one of the big enablers for the adoption of AI and ML.

Key Takeaways

- The support and funding gained from innovation clusters can be instrumental in allowing startups to become established.
- The adoption of AI and data is predicated on existing firms having clear goals for how new technologies can improve their existing processes.
- Investment into systems to improve the availability of cleaned data is a key enabler for both the adoption of AI and data technology, but also as an essential change for insurance firms to remain competitive.

A large number of InsurTechs also provide services targeted at insurers themselves. Solutions aimed at helping insurers assess or manage their risk are leading among such services. This includes companies using AI and machine learning to offer improved risk modelling, the use of predictive analytics to anticipate future risks, and the use of new data-sources such as tracking or IoT sensors, but also solutions aimed at helping insurers with compliance and regulatory risks.

Outside of risk, analytics solutions aimed at utilising AI and data to provide insight across a range of topics also account for a significant proportion of InsurTech activity more generally. For example, InsurTech CyStellar utilises geospatial data from satellite images, drones and IoT sensors to deliver insights for insurance underwriting, claims assessment, data verification and risk selection.

Claims themselves are also an area that is seeing a lot of innovation with AI being used to provide faster claims settlement or to reduce fraud. An example is Tractable who use AI to assesses car damage and expedite claims and settlements in real time.

Marketplaces and comparison platforms, and other solutions aimed at improving the sales and resales of insurance also account for a large proportion of InsurTech activity.

Market uptake

Adoption of AI and data technologies among incumbent firms is more difficult to establish. First, establishing the level of adoption within one firm is heavily dependent on reaching the right person within the firm, with answers varying depending on who was consulted. Second, definitions of AI and data can vary widely, making it tricky to compare adoption across firms.

Nevertheless, it is clear that the insurance industry is actively interested in AI and data, with many incumbent insurance companies increasingly investing. For example:

- Aviva, through its venture arm Aviva Ventures, is deploying £100 million to invest in early stage companies with the potential to transform the insurance industry – including through the use of data analytics and the Internet of Things.¹¹
- Allianz have recently teamed up with InsurTech Dinghy to offer on-demand insurance to freelancers.¹²
- AXA has used machine learning to optimize pricing by predicting “large-loss” traffic accidents. AXA is also a founding member of Impact AI, a think and do tank that brings together different stakeholders interested in AI.¹³
- Direct Line has recently set up a new business arm Darwin to provide a digital platform that uses a smart pricing system to provide a price based on the individual.¹⁴

Indeed, a significant rise in investments in AI has taken place in the insurance industry over the last few years. In 2016, 1.33% of insurance companies were investing in AI (Deloitte, 2017), as of 2019, 87% of insurers are investing more than £3.9 million in AI each year, with more than half planning to transform their existing business processes over the next three years (Genpact as cited in Jefferies, 2019). Moreover, in response to the 2019 Annual Global CEO Survey by PwC

¹¹ See <https://www.aviva.com/newsroom/case-studies/aviva-ventures/>

¹² See <https://www.verdict.co.uk/life-insurance-international/news/allianz-insurtech-dinghy/>

¹³ See <http://www.impact-ai.fr/>

¹⁴ See <https://www.computerweekly.com/news/252470866/Direct-Line-built-an-insurtech-it-can-tweak-a-thousand-times-a-day>

(PricewaterhouseCoopers, 2019a), 80% of insurance CEOs said that AI was already a part of their business model or would be within the next three years.

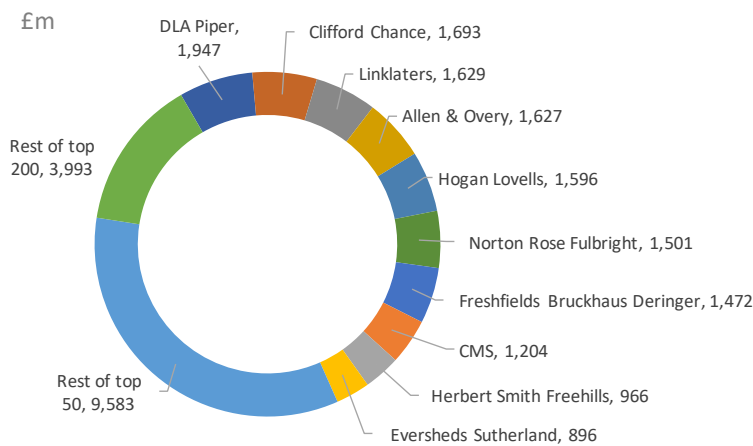
However, despite this, full-scale uptake of AI and data by insurers across the business remains low at this stage. According to a recent analysis by Gartner (Harris-Ferrante 2020), “the 2019 Gartner Financial Services Technology Survey found that 51% were investing in AI: 7% were deployed enterprisewide, 13% had limited roll-out/deployment, and another 31% were in short-term planning or actively experimenting.” While this number has likely risen, widespread and pervasive adoption of AI across the insurance industry has yet to happen.

3.2.3 Legal services sector

Market structure

The UK **legal services** market was valued at £35.1 billion in 2018, with the number of law firms in the UK standing at approximately 12,000 (Businesswire, 2019). Revenue by the top 200 law firms accounted for approximately £28.1 billion in 2018/19. Magic circle law firms¹⁵ accounted for approximately one-quarter (£6.9 billion) of this revenue, while the rest of the top 25 firms accounted for a further £13.7 billion of revenue. Together, the top 25 firms accounted for nearly three-quarters (73.5%) of revenue by the top 200 firms in 2018/19. (Figure 17)

Figure 17 Revenues of largest law firms, 2018/19



Source: *The Lawyer: Top 200 UK law firms 2019 by revenue*

The traditional business model of partnerships is declining with almost half of all firms now structured as incorporated companies. In contrast, Alternative Business Structures (ABS), i.e. firms that allow non-lawyers to own or invest in law firms for the first time, are on the rise, albeit from a low base, with almost 1,300 firms in England and Wales now operating under this model. In terms of market segment, legal work for business and commercial affairs (including commercial property) accounted for almost half of total market revenue in 2018 (nearly 47%) with most of the high-value work in this segment being undertaken by the larger law firms. (Businesswire, 2019) In addition, there are over 400 barrister chambers and more nearly 17,000 practicing barristers providing advocacy services in court and before arbitrators and other tribunals (Bar Standards Board, 2019).

¹⁵ Allen & Overy, Clifford Chance, Freshfields Bruckhaus Deringer, Linklaters and Slaughter and May

The market structure is similarly skewed, with a few specialist chambers accounting for much of the sector’s revenues.

Applications

The LegalTech segment is smaller and less mature than the insurance segment. In the analysis in Section 3.1, nearly twice as many AI and data companies working in the insurance sector compared to those working in the legal sector were identified. This confirms analysis undertaken by the Law Society (2019) last year, who found that the LegalTech segment is still nascent and less mature compared to InsurTech and indeed FinTech.

Moreover, according to the report, innovation in the LegalTech segment in the UK remains more focused on efficiencies and automation than on delivering ‘new types of law’ with innovation being less disruptive than other types of technology. This is also reflected in the solutions of LegalTech companies identified for this study. In contrast to the insurance segment, few were currently developing, or had developed, technologies aimed at disrupting the legal sector. Instead, innovation is focused on delivering products and services that help law firms undertake their activities.

Following, and slightly adopting, the recently developed taxonomy by Legal Geek (2019), identified AI and data companies in the legal sector were categorised into the categories shown in Figure 18. Identified trends broadly reflect Legal Geek’s own recent analysis of LegalTech startups and scaleups in the UK and EU (Legal Geek, 2019).

Unsurprisingly, given the LegalTech sectors’ current focus on delivering efficiencies, a large proportion of identified solutions is targeted at helping law firms manage their practices. This includes services aimed at helping law firms with recruitment and outsourcing; finance and operational solutions, as well as solutions to manage and gain new clients.

Figure 18 AI and data companies in the legal sector, by segment



Note: Further details for a large number of LegalTech startups can be found in [Legal Geeks’ startup map](#).

Source: London Economics; classification adopted from (Legal Geek, 2019)

LegalBeagles: Improving access to justice via AI enhanced legal advice



LegalBeagles Who are LegalBeagles?

LegalBeagles is a legal support community, founded in 2007, offering access to a range of products and services helping users deal with legal issues they are facing. This includes provision of information on legal topics such as court claims or employment issues, help finding a lawyer (via LegalBeagles' sister site JustBeagle.com), and a discussion forum where users can ask legal questions.

How does AI come into the picture?

LegalBeagles currently relies on a group of dedicated volunteers providing legal support to consumers. As the user base has grown and with the issue of access to justice, there has been an increasing volume and complexity of legal issues. Meeting this demand requires a huge increase in volunteers. AI offers LegalBeagles the opportunity to help meet demand by locating legal knowledge faster, identifying new patterns and trends, whilst helping consumers with their legal issues by predicting the best routes to find solutions.

What stage of the journey are you at?

LegalBeagles is in the development stage with around one year still to go. The first step was to map out a sub-area of employment to develop a bank of synonyms. This included mapping out the numerous ways in which consumers ask essentially the same question; the associated key words and phrases; and by which other terms it could be known. Following this, they developed a decision tree and potential dialogue for a variety of situations around that one question. This mapping, together with other legal research documentation, legal case law and employment legislation, will now be used as an input to an AI algorithm and then tested by using past threads from the forum on the same subject area. Once the model works well for the employment area, this process will be replicated for the other legal areas.

What was the key challenge you faced?

The key challenge LegalBeagles faced was when their technology partner decided to pull out of the project. This was a significant blow to team, raising questions around what would happen to the project and how they could continue. However, the team did not let that stop them, and, together with the support of their monitoring officer and Innovate UK, they set about finding a new technology partner. This mission was successful, and the project re-started at the beginning of May.

“What was great to find out was, that the strength of our application for the Innovate grant funding lay in what LegalBeagles brought to the project. We had the forum, the community and the legal knowledge data.”

What can other innovators learn?

Pam Austen, COO of LegalBeagles, has the following advice for other innovators: “You have to take strength from having a good team around you, keep your goals in sight and be prepared to admit if something is not working and change it. Be discerning about the network you create around you, make sure they really are the correct people for your business and can really provide the support they say they can. Be prepared to walk away if not. Enjoy the small wins they really help along the way!”

Key takeaways:

- Like any R&D project, an AI project comes with challenges and potential setbacks. It's important to be clear of the value AI can ultimately bring, learn from setbacks and to have a strong and supporting team behind you.
- When looking for partners, be clear on what you bring to the table – your intangible assets could be your biggest strength.

Source: London Economics based on information provided by Pam Austen, COO of LegalBeagles

A large proportion of identified AI and data companies are also working in Document & Contracts space. This comprises services to help law firms extract and make sense of information from documents, help with contract generation, as well as contract and document management systems. A number of companies were also providing solutions focused on the whole document lifecycle. Risk management and compliance, matters and rights management, and knowledge management are also areas with significant activity. A prominent example is ThoughtRiver, who provide legal contract and portfolio reviews as well as comprehensive risk-assessment for each contract. The ThoughtRiver software uses NLP techniques developed with ML experts at Cambridge University.

Despite the segment's focus on delivering efficiencies, a significant proportion (around 20% of AI and data startups identified) have also developed consumer solutions directly seeking to improve access to justice. These include legal marketplaces connecting clients to law firms that suit their needs (e.g. myBarrister). But also solutions providing direct legal services such as automated generation of wills (e.g. Arken.Legal, Farewill), legal assistants providing direction to the most appropriate legal resources (e.g. DoNotPay), services providing help to consumers with their legal matters (e.g. LegalBeagles, LEXSnap), as well as other services designed to improve access to justice.

Market uptake

Among law firms adoption is mixed. On the one hand, major law firms as well as many mid-sized firms appear to all be using, or at least experimenting with using, some form of AI in their business. Indeed, several incumbent firms are actively investing in LegalTech or have set-up their own acceleration programme; for example:

- Allen & Overy support LegalTech startups to develop innovative solutions, and recently, in collaboration with Deloitte, launched MarginMatrixTM, a derivatives compliance system helping banks draft documents to satisfy new regulatory requirements.¹⁶
- Slaughter and May have their own legal incubation programme, Fast Forward, supporting the work of early and growth-phase technology businesses.
- Mishcon de Reya have their own acceleration programme for tech startups in the legal space, MDR LAB, open to companies at concept through to revenue-generating stage, applicable to the legal industry.

On the other hand, uptake of AI and data technologies by law firms themselves appears concentrated on established technologies, for example, the legal research solutions Luminance and Kira. This is consistent with the Law Society findings who found that the rise in the number of LegalTech companies seen in the last few years, has not translated into an acceleration in the rate of LegalTech adoption among legal practitioners (The Law Society, 2019).

Uptake in other areas of law such as barristers' chambers and courts is slow, with the impact of LegalTech not felt particularly widely yet. The consequences of COVID-19 will be interesting to observe here. Social distancing has meant that traditional court hearings are not feasible for the time being. Therefore, many courts are now experimenting with digital technologies. Indeed, even Britain's supreme court, for the first time in its history, is now conducting cases entirely by video link. Could such unprecedented adoption also bring a significant shift in the uptake of other data / AI technologies?

¹⁶ See <https://www.culs.org.uk/per-incuriam/tech-wizards-your-guide-to-ai-and-the-magic-circle>

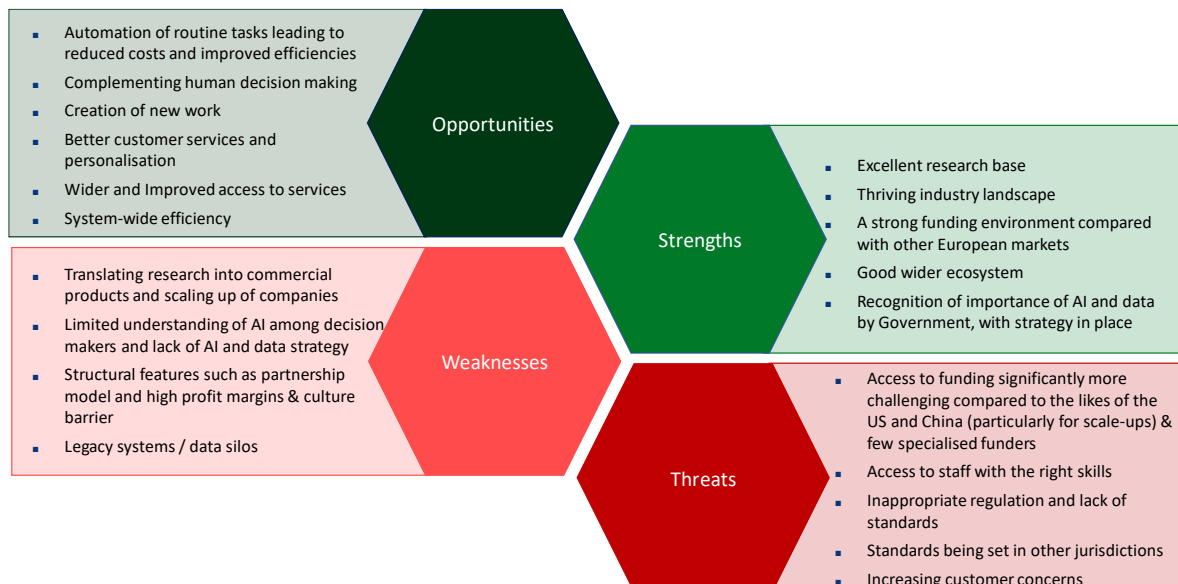
4 The future of AI and data technologies in the UK services sector: Enablers and barriers

AI and data technologies provide significant opportunities for the UK services sector. Overall, the UK is in a strong position to exploit these opportunities. Nevertheless, there are a number of challenges facing UK companies and innovators and areas where the UK could improve. These include translating research into commercial products and services; scaling up innovative companies; improving access to funding, staff and the wider ecosystem; as well as structural features of the services sector.

As Section 2 made clear, AI and data technologies have far-reaching economic effects, with the potential of bringing significant opportunities for the services sector. Moreover, the UK services sector is a traditional strength of the UK and is in a good position to benefit from AI and data technologies. However, Section 3 has shown that, while the UK services sector benefits from a thriving AI and data startup ecosystem, widespread adoption among incumbent firms in the services sector remains low at this stage. Therefore, this section provides an analysis of the forces driving uptake of AI and data technologies in the UK services sector as well as the challenges and barriers faced by AI and data startups and incumbents alike.

Figure 19 provides an overview of the identified strengths and weaknesses of the UK AI and data ecosystem, as well as the opportunities for and threats to adoption with the services sector. The remainder of this section provides further details of the drivers as well as challenges (Sections 4.1 and 4.2, respectively) influencing the adoption of AI and data technologies in the UK services sector, as well as thoughts on future trends in the sector, and aspects that may shape future AI and data adoption (Section 4.3).

Figure 19 Strengths and weaknesses of the UK AI and data ecosystem, and opportunities for and threats to adoption with the services sector



Source: London Economics

4.1 What is driving uptake and innovation in the services sector?

Several drivers, from both the supply and demand sides, influence and shape innovation in AI and data technologies for the accountancy, legal and insurance sectors. Drivers include **increasing efficiency and productivity gained from advances in technologies, changing workforce and skill demographics, rising and shifting consumer expectations, new disruptive entrants**, and a comparatively **strong AI and data ecosystem**. These drivers are discussed in further detail throughout this section.

On the supply side, adoption of AI and data technologies in the services sector appears to be driven by the uptake by large incumbent firms, such as ‘Magic Circle’ law firms, ‘Big 4’ accountancy firms, and large insurers, as well as, through new entrants, who specialise on providing and utilising tech-related products, such as InsurTech, LegalTech or AccounTech firms, entering the services sector.

Increasing efficiencies from advances in technologies

Adoption of AI and data technologies can lead to improved productivity and lower costs. AI and other data technologies can be used to improve processes such as fraud detection, data analysis, document review and customer interaction (Deloitte, 2017; ICAEW, 2018; The Law Society, 2019). For example, this can take the form of an AI algorithm scanning for keywords in a contract and extracting relevant information, or an AI-based chatbot serving as the first point of contact for a businesses’ customer services. Automation of these and other tasks can reduce operating costs for firms and increase efficiency of their workforce, thus providing firms an incentive to adopt. As AI and data technologies become more sophisticated, the level of efficiencies potentially gained also increases, therefore providing further incentives for firms to adopt.

Changing workforce demographics

As AI and data technologies have evolved, so too has the workforce. Education curriculums have changed to provide training in skills and concepts which have been introduced into the market as a result of new technology. For example, LegalTech modules have been introduced into university curriculums as part of an increased focus on technologies within education (The Law Society, 2019). Additionally, many UK universities now also offer masters’ programmes in LegalTech (e.g. the University of Law’s MSc in Legal Technology and Swansea University’s LLM in LegalTech). The availability of specialised tech training, through formal and informal programmes, has increased the proliferation of tech skills and interest within the workforce.

Additionally, in the UK, the uptake of higher-education computer science training has also been increasing. The number of students enrolling in computer science degrees has increased by 7% between the 2017 and 2018 academic years alone (Higher Education Student Statistics UK, 2020). Coupled with the number of training opportunities available, for example, through bootcamps, online and night courses, in addition to formal university education, the proliferation of skills in AI and data technologies is likely to continue to increase.

These changing skillsets among the workforce in turn aid adoption of AI and data technologies, by allowing firms to more easily implement and exploit these technologies.

Customer expectations

Rising customer expectations are a further common driver of innovation across the three services sectors. Consumers, including retail and corporate customers, now demand higher quality products

and better customer service. The Law Society (2019b) notes that client pressure is one of the most significant drivers for adoption of new technologies in the LegalTech segment. Similarly, Sachdev & Tottman (2018) note that rising consumer expectations in the insurance sector have, at least in part, been shaped by technological advances in other industries. Consumers are now able to track services such as their Amazon delivery and their uber drivers and may wonder why they should not also be able to track their insurance claims in a similar fashion (Sachdev & Tottman, 2018).

Changing customer expectations are also driven by the emergence of a new generation of customers that have grown up with technology. This new type of customer, the 'Millennial', demands higher quality products and customer service, but is also fluid in, for example, their insurance needs, willing to shop around and wants to be recognised as having their own unique needs (PricewaterhouseCoopers, 2019).

AI and data technologies can help firms to meet these rising customer demands. Indeed, PricewaterhouseCoopers (2019) finds that, in response to the changes in the customer base, 54% of insurers are already investing in AI to increase efficiencies and to help them better understand customer needs.

COVID-19 may bring further significant changes in customer expectations and demands. Almost overnight, the crisis resulted in physical stores being shunned and online retailers being overrun. As the crisis progressed, changed consumer patterns have increasingly emerged. Granted, no-one knows for sure how the crisis will affect consumer patterns going forward, and indeed how this will affect the legal, insurance and accountancy services sectors over the medium term. What is clear, however, is that firms will have to be mindful of what kind of customer is emerging from the crisis and ensure that their products and services are suitable for that consumer.

Disruptive entrants

Changes in customer expectations, combined with the emergence of new technologies, in turn have enabled disruptive new competitors to enter the services sectors. An example of an InsurTech disruptor is Brolly, a personal insurance app which uses AI to scan emails and consolidate all existing insurance policies to find where consumers were being overcharged. From this app, users can have access to all related documentation and information about their policies, as well as have the ability to purchase additional policies (Heathman, 2019).

The potential revenue opportunity from disruption in the insurance market alone is estimated at £50 billion by 2030 (PricewaterhouseCoopers, 2019b). Incumbent firms therefore increasingly need to invest in technological advances in order to capture part of this slice or indeed to remain competitive.

AI and data ecosystem

As highlighted in Section 2, the UK has a comparatively strong AI and data ecosystem, which helps foster innovation, with a strong research base as well as a thriving industry landscape. This strong AI and data ecosystem provides a strong foundation for continued innovation in the services sector.

Sibyl AI: Will we win and what counts as winning? Using AI to spot trends and predict claims outcomes for lawyers and insurers



Who are Sibyl AI?

Sibyl AI is an early-stage LegalTech startup on a mission to simplify legal claims. Sibyl AI works at the intersection of law and insurance, helping lawyers and insurers analyse legal claims, predict outcomes and spot trends.

The team met at the Online Courts Hackathon 2017, organised by HM Courts and Tribunals, Legal Geek and the Society for Computers and Law, where they won the coolest tech prize.

How can Sibyl AI help law firms and insurers?

Assessing claims is both labour-intensive and data heavy. Currently, lawyers have to review claims documents manually and form a view on the likelihood of success; the potential cost of the claims; whether there is a chance of a settlement; and what the pay-out may ultimately be. They also need to spot trends and suggest risk mitigations. While the cost of this varies according to the type and complexity of the claim, Sibyl AI believes this represents 15% of the cost of a claim on average.

Sibyl AI supercharges the claims assessment process by using artificial intelligence to derive insights from unstructured claims documents. Sibyl AI uses text extraction and natural language processing to extract key features from documents. These are then used as inputs for machine learning algorithms in order to generate insights about likely outcomes and provide data driven trend analysis. There are efficiency and quality benefits to this approach. The move from anecdotal to data-driven advice means lawyers are better at identifying risk and adding more value to clients.

What stage of the journey is Sibyl AI currently at?

Since founding Sibyl AI, the team has worked on developing their technology and gaining commercial traction. The team has so far demonstrated the first two parts of their technology with a UK law firm and a European insurer. Results of these demonstrations, shown in the boxes on the right, are promising. Sibyl is supported by the OXFO L.E.V8 accelerator at the Oxford Foundry.

What can other innovators learn from Sibyl AI's journey?

Following the Online Courts Hackathon, the team found gaining market traction one of the greatest challenges. According to Richard, one of Sibyl AI's founders, it takes a long time to build up enough industry knowledge and trust before people give you an opportunity. Moreover, many providers have emerged in the LegalTech space in recent years, which means the landscape can be confusing for law firms. The challenge for entrepreneurs is to figure out where the urgency is. This is one of the reasons why Sibyl AI placed itself at the intersection of law and insurance.

Key takeaways

- Bringing creative people together, in this case in the form of a hackathon, is a way in which public support can help generate innovative businesses.
- Efficiency and quality improvements that AI and data bring could be very significant (up to 15% of the cost of the claims process in this case).
- Gaining market traction as an innovator in the LegalTech space can be difficult. Entrepreneurs should think carefully about which challenges they are solving and how their solution adds value.

Working with a UK law firm, Sibyl AI used their software to extract key data points from medical reports, achieving an accuracy of 97% (30% better than humans at this task).

Sibyl AI used their technology to extract text from the unstructured claims documents of a European insurer, achieving an accuracy of 96%.

Using a sparse data set of claims against mortgage providers, Sibyl AI achieved an 81% accuracy in predicting whether claims will pay out.

Source: London Economics based on an interview with Richard Strauss (CEO and co-founder of Sibyl AI); and, Richard Strauss (2018). Meet Sibyl AI – The New Claims Prediction System. Published in the Artificial Lawyer. Available at: <https://www.artificiallawyer.com/2018/07/20/meet-sibyl-ai-the-new-claims-prediction-system> [accessed 27/03/2020] Picture credits: Pictures courtesy of Sibyl AI.

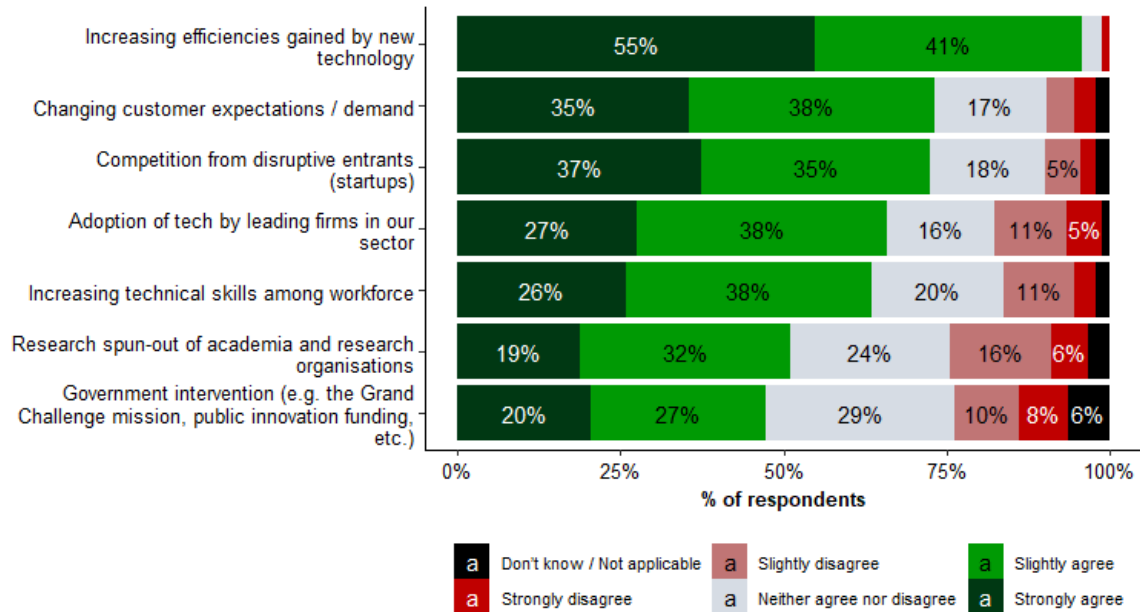
4.1.1 Which drivers are key?

In order to understand the relative importance of the drivers discussed in the previous sections, respondents to the survey undertaken for this study were asked about their views on key drivers of innovation within the UK services sector. The outcomes of this consultation are shown in Figure 20.

Survey results suggest that the benefits AI and data bring to adopters are the number one driver to innovation within the sector, with 96% of all survey respondents agreeing that increasing efficiencies is a key driver of AI and data innovation. This is mirrored in the experiences of IT and consultancy firms, most of whom agreed that reducing time spent on routine tasks (82%) and improving productivity (91%) were among the main drivers of adoption for their clients.

Figure 20 Drivers of innovation as seen by survey respondents

In your opinion, what are the key drivers shaping AI and data innovation for the UK services sectors?



Note: No. of responses between 90 and 93. Source: London Economics

Competitive pressures were also seen as a key driver among survey respondents, with 73% of respondents agreeing that competition from disruptive entrants drives innovation, and 82% of IT and consultancy firms agreeing that securing future competitiveness was a main reason for adoption for their clients.

73% of respondents agreed that changes in customer expectations and demand were a key driver of innovation, while 66% of respondents identified adoption of tech by leading firms in their sector as a key driver of innovation. Note that most of the survey responses were received prior to COVID-19. Therefore, some drivers such as adoption of tech and customer expectations may, perhaps, now score higher.

4.2 What are the key challenges and barriers to adoption?

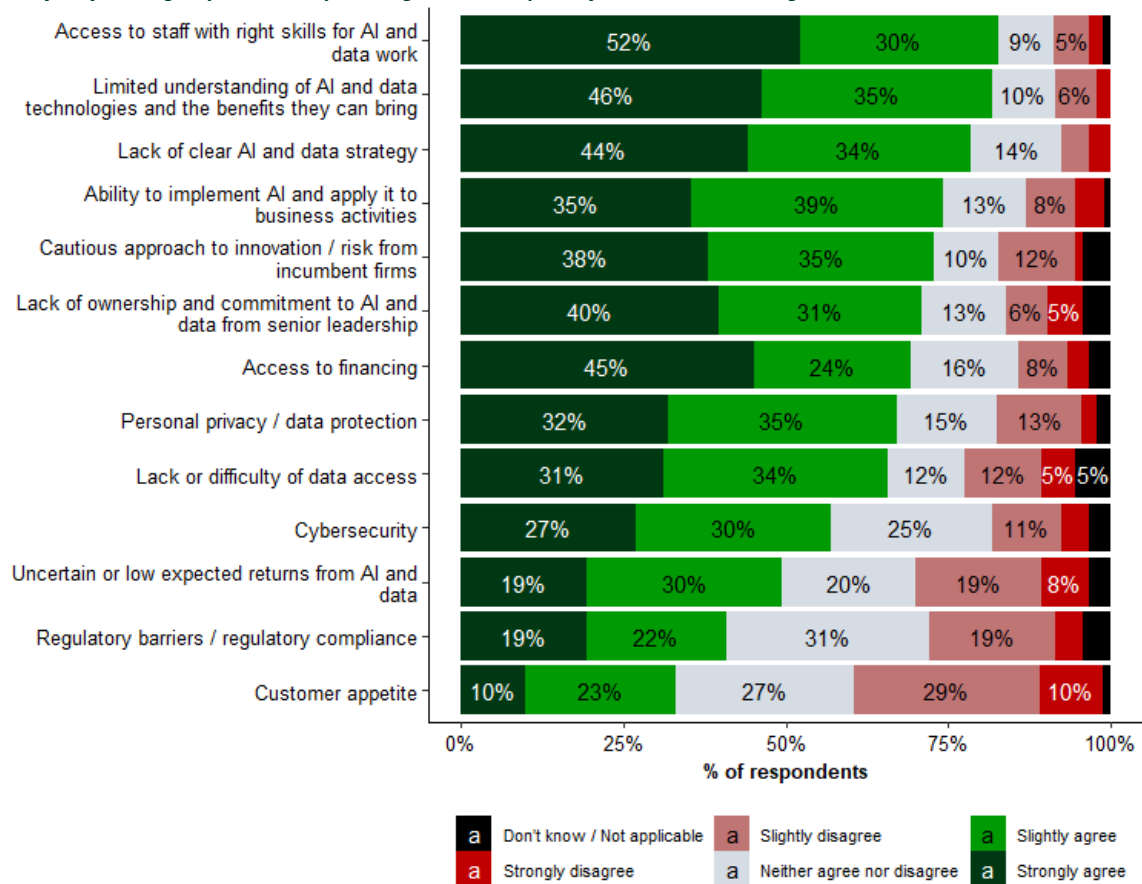
This section presents challenges and barriers to the adoption of AI and data technologies within the services sectors. Identified barriers include financial barriers, as well as barriers related to shortage of skills, access to data, and sector-specific factors such as the partnership model, among others.

Access to skilled staff and financing

Access to staff with the right skills, and financing were identified as key challenges to adoption of AI and data with 83% and 69% of survey respondents, respectively, agreeing. 74% of respondents further agreed that the ability to implement AI and apply it to business activities was a key challenge to adoption. (Figure 21)

Figure 21 Survey respondents’ views on challenges to adoption of AI and data

Which of the following do you see as key challenges to the adoption of AI and data technologies within the services sectors?



Note: No. of responses between 93 and 93. Source: London Economics

An inability to hire people with the skills equipped to take full advantage of AI and data technologies also creates a further barrier slowing down the adoption of AI and data technologies. Silbert (2019) notes that firms in insurance find it hard to hire enough trained data scientists to implement and utilise these technologies. In the accountancy sector, the ICAEW, 2018 notes that the accountancy skillsets will also have to change to enable understanding and auditing of AI/ML-based models and results. While in the law segment, The Law Society (2019b) highlights the challenges of training lawyers on new technology stemming from a very busy schedule of junior lawyers as well as a sometimes cultural reluctance to change among more senior lawyers.

However, it should be noted that hiring talent alone is not enough. Firms also need to have the ability to utilise this talent in the right way in order to derive value from the skills they bring. This is highlighted by recent analysis of LinkedIn skills data by Rock (2018), who finds that, while additional engineering talent at a firm is associated with significant additional value on average, these effects disappear once controlling for unobserved firm-level effects. This suggests that firm-specific intangible assets complementary to engineering talent generate the value. It is therefore

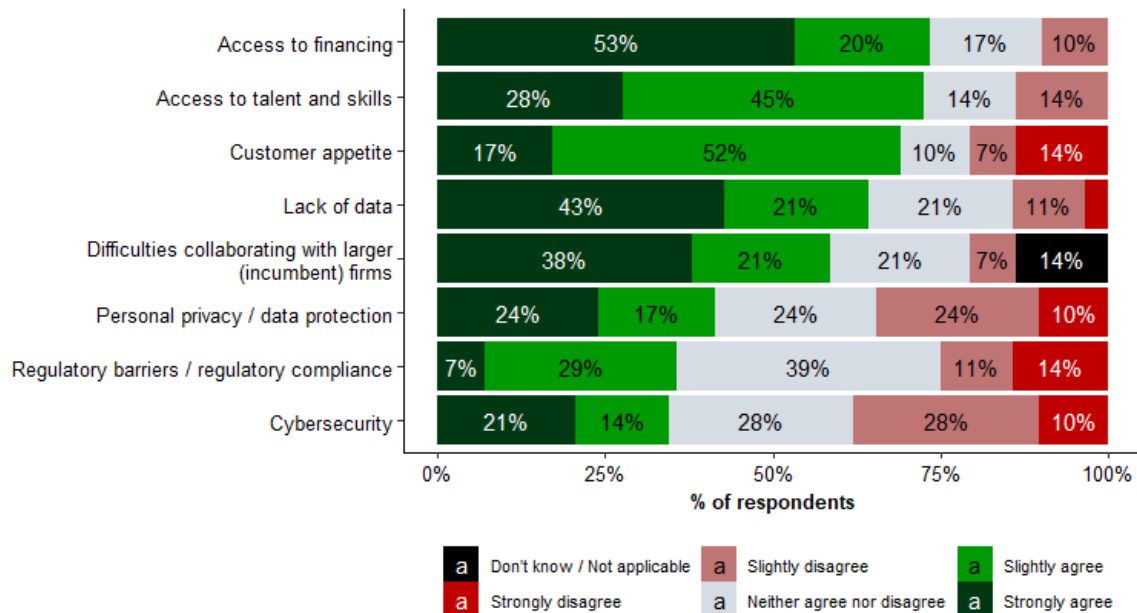
imperative, as noted by Nesta (Mateos-Garcia, 2019), that investments in skills are complemented by investments in IT and data infrastructure and business processes.

Barriers around accessing financing can arise from both low levels of investment and from lags in investments increases relative to the rate of technological advancements. For example, among accountancy firms responding to a recent survey undertaken by Thomas-Bryant (2019), 38% of respondents cited a lack of money to invest as a reason why technological adoption was lagging. This is despite 58% of respondents suggesting that they are looking forward to adopting AI applications.

Challenges around accessing talent and funding are not limited to adoption, but were also identified as key challenges among AI and data startups/SMEs responding to the survey (with 72% and 73%, respectively, agreeing). Indeed, more than half of AI and data startups/SMEs strongly agreed that access to financing was a key challenge for them; significantly more than for any other challenge. (Figure 22)

Figure 22 Challenges among AI and data startups/SMEs responding to the survey

Which of the following do you see as the key challenges for your organisation?



Note: No. of responses between 28 and 30. Source: London Economics

Low levels of investment appear to be particular barriers in the legal and accountancy segments. For example, despite the UK being one of the leading emerging LegalTech centres worldwide, the Law Society (2019b) notes a current shortage of funds to invest into LegalTech investment. However, despite the current investment barriers in LegalTech, The Law Society (2019a) notes that investment in this segment is likely to increase. Within accountancy, the ICAEW (2018) notes that using machine learning to develop more intelligent products in specialist accountancy areas may lack the market potential to justify investment from software developers.

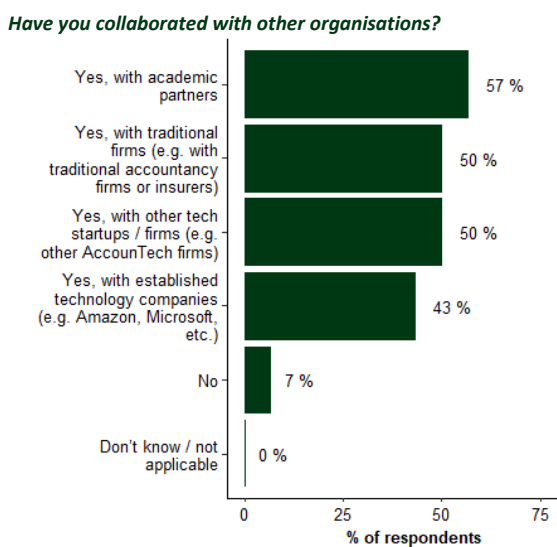
Access to incumbent firms

Survey results also suggest that access to incumbent firms can be a challenge for AI and data startups with 59% agreeing that collaborating with incumbent firms provides difficulties, and 69% identifying customer appetite as a challenge for them. (Figure 22)

Results indicate that one of the reasons for this may be a limited understanding of AI and data and the benefits it can bring, which 82% of respondents agreed was a challenge for adoption. While many firms have Innovation or technology officers, they often do not make the decisions on what to adopt / invest in. Therefore, limited understanding of AI and data presents a particular challenge if prevalent among senior decision makers; and if it manifests itself as a lack of a clear AI and data strategy (identified by 78% of respondents as a challenge). (Figure 21) Moreover, many providers have emerged in the InsurTech and LegalTech scenes over the last few years, which means the landscape can be confusing for law firms and insurers and knowing which products will deliver real benefits for them can be difficult.

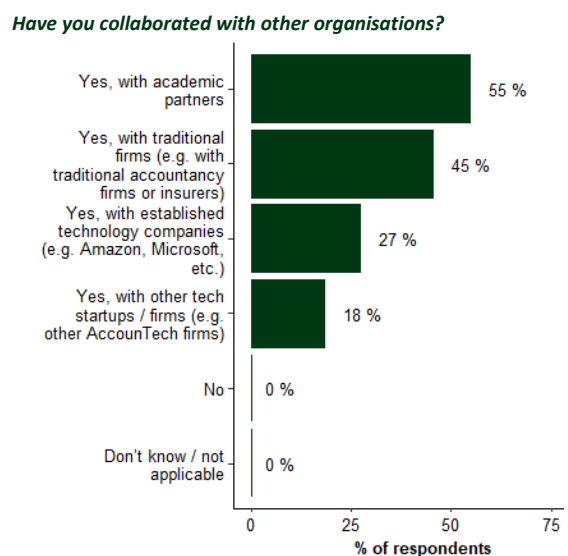
However, despite this, 50% of AI and data startups/SMEs and 45% of IT and consultancy firms responding to the survey said they had collaborated with incumbent firms. (Figure 23 and Figure 24)

Figure 23 Collaboration among AI and data startups/firms responding to the survey



Note: No. of response = 30. Source: London Economics

Figure 24 Collaborations among IT and consultancy firms responding to the survey



Note: No. of response = 11. Source: London Economics

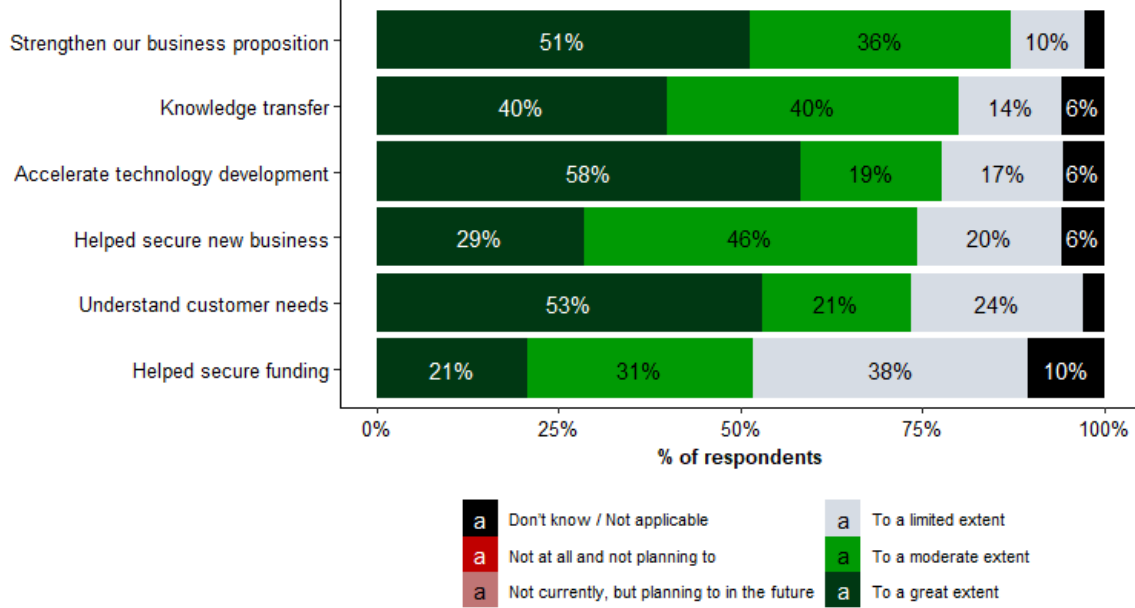
Moreover, around 50% of AI and data startups/SMEs surveyed had also collaborated with other tech/data startups and 43% had collaborated with established technology companies. IT and consultancy firms were less likely to have collaborated with other established IT companies or tech/data startups.

Collaborations with academics were relatively prevalent among both AI and data startups/SMEs (57% of which had collaborated with academics) as well as IT and consultancy firms (55% of which had collaborated).

In general, collaborations were seen as helpful for companies' in developing and commercialising their solutions. (Figure 25)

Figure 25 Impact of collaborations among survey respondents

How have these collaborations helped you in developing / commercialising your solution?



Note: No. of response between 29 and 39. Source: London Economics

Ethical and liability concerns

The usage of AI and data technologies can also lead to privacy, ethical and liability concerns. For example, solutions in the service sector will need to interact with client data, which is protected under GDPR. This creates a potential risk of data breaches, particularly for cloud-based products and services, and associated potentially large GDPR fines. Moreover, some law firms still consider internal legacy systems to be safer than newer solutions hosted on the cloud (The Law Society, 2019). Ethical questions around allowing an AI to examine personal data also need to be fully addressed to assuage concerns of late adopters (ICAEW, 2018).

In the legal industry in particular, there are further concerns that a relatively narrow set of people are developing AI algorithms. This means that the viewpoints and considerations of this set of people may not be broad or deep enough to encompass all possible nuances in legal decision making. This may lead to issues with liability where an algorithm fails to come to the same conclusions as human intelligence. Cases where an AI-based model may be inaccurate or provide a different conclusion to a manual examination, may lead to law firms being exposed to liability issues if advice is provided on the basis of recommendation by AI and data technologies. The potentially large costs incurred by law firms as a result of inaccuracies from AI and data solutions may be a further reason for slow uptake of these technologies in the legal sector. (The Law Society, 2019)

While cybersecurity, and privacy and data protection issues were seen as important concerns when adopting AI and data, they were seen as less of a challenge among AI and data startups/SMEs responding to the survey. (Figure 21 and Figure 22)

InsurTechnix: Using AI to better price cyber risks, while protecting SMEs from cyber-attacks and data breaches



Who is InsurTechnix?

InsurTechnix was founded in November 2017 by an experienced team of technology entrepreneurs. Co-founders, John Clarke and Fiona Kinghorn, had worked together previously at a med-tech startup which processed patient data in the cloud. Cyber security was paramount but there were no cost-effective tools to manage cyber risks. The original idea was to develop a simple detection and reporting tool, the CyberSentinel, to help SME executives identify, quantify and manage their exposure to cyber risks and data breach. SMEs are particularly vulnerable to cyber attack and they are least equipped to survive an attack – 60% go out of business within 6 months of an attack¹.

How did insurance and AI come into the picture?

However, from the start InsurTechnix wanted to avoid selling directly to SMEs. This market is fragmented and requires a significant investment in marketing, which the company admits is not one of their core skills. Instead, they saw an opportunity to transform the high growth and far larger global cyber insurance market in much the same way as ‘telematics’ transformed the auto insurance industry. Because the CyberSentinel collects device level cyber risk data, InsurTechnix can provide cyber insurers with real-time insights into the evolving risk of their policyholders. The global cyber insurance market is projected to reach \$28.6 billion by 2026, growing at a CAGR of 25% - orders of magnitude greater than the UK SME market for cyber security products².

InsurTechnix’ model is to white label and sell their technology to global cyber insurers. Insurers then distribute the technology to their policyholders through their established distribution channels as a free tool in exchange for the metadata. This model enables InsurTechnix to reach a large number of end-users, enabling them to scale the business. Over time, InsurTechnix’ objective is to combine AI and automation throughout the policy lifecycle to drive material uplifts in profitable revenues and to minimize risk and reduce costs for cyber insurers.

What have been the key challenges?

Fiona Kinghorn, Co-Founder and CEO of InsurTechnix, notes that the key challenge initially was developing the technology with limited funding and resources. InsurTechnix’ distribution approach further means that they need to be the sort of company that a large enterprise is comfortable doing business with, as John Clarke, Founder and CIO of InsurTechnix remarked in a recent interview with ideaSpace. This means on-time deliveries, speedy resolution of issues and absolutely no surprises, in addition to the innovation the technology enables.

InsurTechnix’ multi-stage distribution approach also means that the slow sales cycles in the insurance market presents a continuous challenge for the company. This is exasperated by the current COVID-19 crisis, and its impact on the insurance sector, which has not helped decision speed. At the same time, as remote working has become the new normal, the crisis means that protecting against cyber risks has become an even more pressing priority for SMEs. InsurTechnix is therefore focusing on immediate revenue opportunities outside the insurance sector through direct sales to larger organisations and to SMEs through channel partners.

The CyberSentinel is currently being evaluated by an international cyber incident response business as the CyberSentinel can be used to perform remote risk assessment and examination of the detailed logs to identify the exact nature and cause of an incident. InsurTechnix have recently signed an evaluation license with a large financial services organisation to support their data protection compliance. This is significant as it shows that there is a demand for the CyberSentinel beyond just SMEs into the enterprise market.

Key takeaways:

- Partnering with incumbent firms can be a great way to reach customers and achieve scale. However, as a company you need to be able to deliver and be a robust and trustworthy partner.

Source: London Economics based on contact with InsurTechnix; and, ideaSpace: Lessons from a founder: What's Your 2019 Startup Goal? Available at: <https://www.ideaspace.cam.ac.uk/2019goals>; and KTN: Shine a Light: Using AI to Transform the Insurance Sector. Available at: <https://ktn-uk.co.uk/news/shine-a-light-using-ai-to-transform-the-insurance-sector>; (1) <https://cybersecurityventures.com/60-percent-of-small-companies-close-within-6-months-of-being-hacked/>; (2) <https://www.alliedmarketresearch.com/press-release/cyber-insurance-market.html>

Data access

In addition to privacy, ethical and liability concerns, there are also structural issues with data access. Data is critical for the training of AI-based solutions. Therefore, being able to access the right data is a significant factor in the success of implementing new technologies. Similarly, a lack of access to the right data, for example because of legacy systems or data 'silos', can provide a barrier to the adoption of AI and data technologies. In the accountancy sector, for example, traditional accounting data is well-structured and high quality but is often not fully accessible, especially if the data is contained within legacy systems (ICAEW, 2018). Indeed, 64% of AI and data startups/SMEs responding to the survey agreed that lack of data was key challenge, with 43% agreeing strongly. Issues around data access were also emphasised by many stakeholders consulted via depth interviews (Figure 22). As mentioned above, investments in skills and AI talent need to be complemented by investments in intangible assets, including a good data infrastructure, in order to derive the most value.

Regulation

The involvement of a regulatory body can both be a driver as well as a barrier to the adoption of AI and data technologies. In the FinTech and InsurTech segments, the Financial Conduct Authority (FCA) is heavily involved in shaping regulation in response to changes stemming from technological advancements. This close alignment with the FCA has meant that expectations have been kept realistic, and their hands-on involvement has provided a level of trust in the sector (The Law Society, 2019).

In addition, the Chartered Insurance Institute (2019), with the help of trade bodies and insurers in the sector, has also launched a digital ethics companion to their code of ethics, providing professionals in the field with guidance on how to deploy AI and data responsibly. (Centre for Data Ethics and Innovation, 2019)

Creating sector specific regulation taking into account the sector specific characteristics and targeted at fostering innovation while protecting consumers appears to be the right way forward. In this respect, it is worth noting that Suk Lee, Y. et. al. (2019) who surveyed businesses about how AI regulation would affect adoption, find that regulation, in general, reduces the rate of adoption of AI technologies - though general-purpose regulations would create more barriers than industry- or agency-specific AI regulation.

In the legal sector, regulation has been slower and less hands-on. This regulatory lag has created a disconnect between regulation and advances in technology, which has slowed adoption of LegalTech within the sector, as well as prevented many genuinely disruptive firms from entering the market (The Law Society, 2019). Moreover, the current costs and efforts required to comply with regulations in the law sector present a further barrier to entry for smaller firms, as well as a barrier for the creation of disruptive and innovative products and services.

In the accountancy sector, adoption of AI technology is still in the early stages (ICAEW, 2018). This presents an opportunity for regulators to actively encourage adoption of AI and data technologies and foster innovation in the sector. Indeed, a recent report by the ICAEW (2018) notes that the involvement of regulators and standard setters is essential to achieving change in areas such as audit or financial reporting. The report therefore suggests that regulators and standard setters need to build their understanding of the application of AI and be comfortable with any associated risks.

However, despite these considerations it should be noted that regulatory barriers and compliance issues were not seen as particularly key challenges by most survey respondents. (Figure 21 and Figure 22)

Further structural challenges

Adoption of LegalTech and AccounTech is slower than other sectors currently such as FinTech and InsurTech. The Law Society (2019b) cites several law-specific barriers which may contribute to this. First, legal services firms often operate using a billable hour model where lawyers time is charged by the hour. Finding time to explore additional technologies and innovation is thus costly when examined within the scope of the billable hour model as active lawyers will have minimal time to devote to the exploration of new technologies.

Many law firms further operate under a partnership model. This means that profits and equity is shared amongst several different partners. Funds for the exploration of AI and data technologies therefore have to come from a profit pool shared by the partners rather than a separate R&D fund.

Finally, high profit margins within the law industry may further hamper innovation within the sector. In industries with lower profit margins, innovation can be a driver to help reduce costs (e.g. through automation or outsourcing) and thus remaining profitable. Within the legal industry, high margins mean that the need for innovation is dampened thus reducing demand for advancements such as AI and other data technologies.

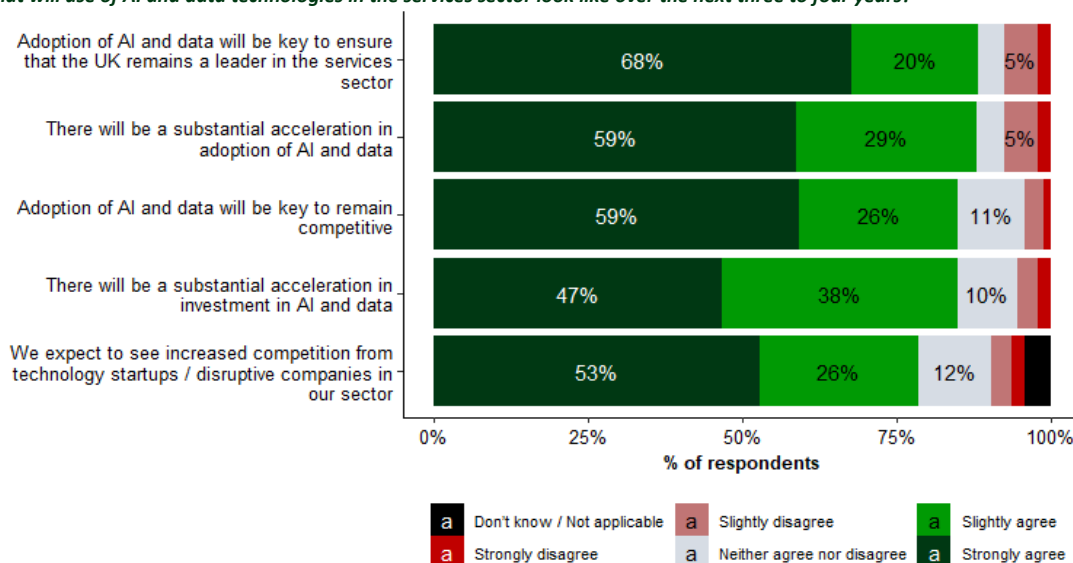
However, these challenges are not unique to legal sector, with many accountancy firms also continuing to favour the partnership model and profit margins being among the highest of any industry (see Cohn, 2017).

4.3 What will the future look like?

AI and data will play an important role within the accountancy, insurance and legal services sectors over the next three to four years and beyond.

Figure 26 Survey respondents' views on future trends in the services sectors

What will use of AI and data technologies in the services sector look like over the next three to four years?



Note: No. of responses between 92 and 93. Source: London Economics

Advances in data availability and openness of data, the lowering of technological barriers and increased competitive pressure, changing attitudes in the industry, and government funding provide further encouragement for the uptake of AI and data technologies within the services sectors. This is reflected in the views of stakeholders in the industry, with 88% of survey respondents thinking that AI and data will be key to ensuring that the UK remains a leader in the services sector over the next three to four years.

Respondents expect to see a substantial acceleration in both investment in (85%) and adoption of (88%) AI and data over the next three to four years. Indeed, survey results suggest that adoption and investment should be an important topic for incumbent firms, with 78% of respondents agreeing that we can expect to see increased competition from technology startups and disruptive companies, and 85% agreeing that adoption of AI and data will be key to remaining competitive.

The remainder of this section highlights some key drivers which are likely to shape adoption of AI and data technologies over the coming years.

Increase in availability of data

Increases in the uptake of technologies that result in an increase in the volume, granularity or quality of data available to firms in the services sectors could lead to an increased uptake in the adoption of AI and data technologies. For example, ongoing accumulation of “digital first” data, through and gradual replacement of analogue legacy data will go hand-in-hand with an increase in the availability of data that AI and data technologies could utilise. This increase in data in turn provides an opportunity for services firms to take further advantage of AI and data technologies to gain a better understanding of the wants, needs and preferences of their customers, thus enabling the creation of more granular product categories and more personalised pricing (Everett et al., 2019; McKinsey, 2018).

Increase in openness of data

Alongside an increase in data, the potential creation of open source protocols, standardisation, and more complete metadata can provide a further opportunity for the usage of AI and data technologies. As data becomes ever more ubiquitous, campaigns such as Open Banking, the Open Insurance Initiative, and the right to data portability (GDPR) encourage the opening and ethical sharing of customer data (Husseini, 2018). This would result in an increase in availability of data access, particularly for non-incumbent players, that can be used to create innovative AI and data based products and services. (McKinsey, 2018). Moreover, as AI and data technologies become more ubiquitous, incumbent firms will also be encouraged to migrate from legacy systems, which often make it difficult to exploit available data, to newer ecosystems, which allow firms to take advantage of AI and data technologies more easily.

Lowering technological barriers

The introduction of automated machine learning techniques can further increase the accessibility of AI and data technologies by alleviating skills barriers (Silbert, 2019). However, uptake of automated techniques will depend on the benefits techniques provide to accountancy, legal and insurance firms and their associated risks. In particular, effectiveness of automated solutions will depend on the creation of clear guidelines and best practices to guide automation and avoid potential pitfalls of using AI and data techniques without in-depth knowledge of these techniques, as well as the need for transparency by ensuring technologies provide an audit trail and decisions made based on outputs of AI are explainable.

Industry attitudes and perception

Changing perceptions of AI and data technologies within the services sector may further contribute to an increased uptake of these technologies. In a 2018 survey by Accenture (Sachdev & Tottman, 2018), 84% of insurers in Ireland and the UK believed that AI will either significantly change or completely transform the industry over the next three years (2018-2021). In 2019, 54% of insurers in the UK market stated that they were currently investing in AI (PricewaterhouseCoopers, 2019b) and 87% of insurers were found, in a separate study, to be investing more than £3.9 million in AI each year (Genpact as cited in Jefferies, 2019).

Additionally, 58% of accountancy firms interviewed in the UK and other developed nations¹⁷ stated that they looked forward to adopting relevant AI applications they believed would be developed within the following three years (Thomas-Bryant, 2019).

Government Funding

Alongside a change in industry perception, increased encouragement and support from the UK government may further contribute to the uptake of AI and data technologies. In 2018, the AI sector deal was launched to support the UK's industrial strategy, part of which includes the development of the AI sector in the UK (gov.uk, 2019). The next generation services challenge was also launched as part of this industrial strategy to investigate how AI and data technologies could transform the UK services industry (UKRI, n.d.). As part of the challenge, £20 million of funding are provided for R&D projects utilising AI and data within the services sectors.

COVID-19

In the wake of the lockdown the world is undergoing at the time of writing, technology is being adopted at an unprecedented scale. Many businesses that were previously hesitant are now actively embracing digital technologies. Indeed, even Britain's supreme court, for the first time in its history, is now conducting cases entirely by video link. Such unprecedented adoption could cause a tremendous shift in the deployment of AI and data technologies across the services sector.

At the same time, COVID-19 is likely to also have a significant impact on startups and other innovators in the sector. On the one hand, the crisis is likely to exacerbate funding challenges startups are facing, with less funding is likely to be available. The majority of investors responding to a survey by 500 Startups, a global VC fund and seed accelerator, believed that COVID-19 will have a negative (32%) or somewhat negative (36%) impact on early-stage investment activity in 2020, with most believing the impact could last between one and two years (500 Startups, 2020). On the other hand, the increased focus on digitalisation also presents an opportunity for startups and other innovators, particularly if they are able to support incumbents in their digital transformation.

Overall, however, it is too early to tell what the permanent impact of the crisis will be on AI adoption in the sector once businesses come out of the crisis, or whether innovators will be able to benefit from the rush to digitalisation or falter in the wake of the crisis or falter in its wake. We are looking forward to finding out the answers to these questions in the future; further analysis based on evidence to date is provided in the next section.

¹⁷ Companies interviewed based in US, UK, CA, ES, FR & AUS

Lloyd's Data Lab: Bringing the historic insurance marketplace into the digital age with Artificial Intelligence



Who are Lloyd's and how does AI come into the picture?

The Lloyd's insurance and reinsurance market is a marketplace where, for over 300 years, members have provided insurance-related services, such as advice and underwriting. In the more recent history, Lloyd's has placed a new focus on AI and data. This has led, in 2016, to the establishment of a new data team, the Lloyd's Data Lab, to practically demonstrate how AI and other data technologies can provide value for Lloyd's and its members. In addition to the internal use of AI, Lloyd's also supports innovative InsurTech startups, through its Lloyd's Lab programme, established in 2018 and now in its fifth cohort.

How does AI and the work of Lloyds' Data Lab benefit Lloyd's?

An opportunity to trial AI was spotted in the London-based International Trade Advice (LITA) team which provides time-critical advice on often very complex topics in areas such as law and tax to managing agents in the Lloyd's marketplace. Partnering with an AI firm, the data team set out to develop an AI solution that could support the team. Within six weeks an initial proof-of-concept was developed. The software reads related unstructured data and generates a shortlist of the most appropriate responses to queries, which is then passed to advisers. This resulted in a reduction in average response times from 43 to 6 seconds; representing a significant time saving when considering the hundreds of queries the LITA team receives every day.

Following on from this initial success, a team in Montreal also identified an opportunity for AI. The team's role is to audit all contracts where Canadian law is applicable. The volume of contracts meant that this task was getting difficult to do manually for each contract. Therefore, the team wanted to see whether AI could support them. A software was developed that reads the contracts, intelligently ascertains their context and then checks them against Canadian regulatory requirements.

What were the key challenges?

For Craig Civil, Head of Data Innovation, R&D and Analytics at Lloyds Data Lab, one of the biggest challenges was to ensure that the AI was not perceived by the team to be a mystical tech 'black-box' introduced into the operational process. The POC had to demonstrate the value that the use of AI could bring and augment the business knowledge within the existing team, a tool to make their roles more fulfilling and impactful on a daily basis. e.g. Establishing support and buy-in from the team was therefore a vital component to ultimately achieving success for the POC.

Craig also emphasised the importance of setting measurable success metrics from the start of the POC; avoiding black-box scenarios; ensuring that the appropriate data architecture is in place to support development of AI solutions; and to not rely on a single AI supplier, as suppliers have different areas of strengths and expertise. The projects also presented IT-related challenges. Designing the appropriate data architecture, governance and security able to support AI software were key challenges that were overcome.

Finally, a high level of response accuracy is required of the AI software. To mitigate risk, in the LITA project the member of staff continues to provide the final customer response whilst the AI rapidly searches to present a short list of potential answers. In the Montreal project the high level of accuracy achieved was sufficient to meet regulatory standards with the software now able to automatically process the vast majority of contracts.

Key Takeaways

- Start small and identify a nicely bound opportunity with a hypothesis which can be tested using AI. Use measurable outcomes which allow you to know whether you have succeeded or failed; and avoid 'black box' scenarios – you need to be able to explain and audit what the AI is doing.
- Ensure the team using this software is on board throughout the process as the success of this adoption depends upon support of business owners, business specialists and ultimately the team who will be using this software.
- One supplier cannot provide all the AI solutions you may need, you should aim to have a portfolio of different AI suppliers to cover all your needs.

Source: London Economics based on an interview with Craig Civil - Head of Data Innovation at Lloyd's Data Lab.

5 The impact of COVID-19

5.1 A shock to the system: technology adoption & investment in the crisis

The COVID-19 crisis and the consequent public health measures have had and will continue to have a profound impact on society and the way people work. One of the earliest impacts of the crisis was the large-scale move to home working where possible. ONS data shows that in July, around 51% of UK workers who were not furloughed or off sick were working from home, albeit with large variation shown across sectors (Gough, 2020).

The widespread shift in working patterns poses both challenges and opportunities for uptake of AI and data technologies. There has been a surge in demand for cloud-based services as employees have transitioned to remote working. As a result, cloud services have established their importance in enabling business continuity across many sectors and have shown that those companies that had already established remote-working cloud computing capabilities were better placed going into the crisis. Some service providers reported a 30-40% (ABI Research, 2020) increase in traffic at the very beginning of the crisis. Regarding the worldwide IT spending forecast, a recent Gartner press release provides “all segments will experience a decline in 2020, with devices and data center systems experiencing the largest drops in spending (see Table 1.) However, as the COVID-19 pandemic continues to spur remote working, sub segments such as public cloud services (which falls into multiple categories) will be a bright spot in the forecast, growing 19% in 2020. Cloud-based telephony and messaging and cloud-based conferencing will also see high levels of spending growing 8.9% and 24.3%, respectively” (Gartner, 2020).¹⁸

The increased usage of cloud technologies could lay the foundations for future AI adoption, since cloud providers offer pre-packaged Machine Learning capabilities that allow firms to take advantage of tools such as Natural Language Processing and computer vision (Soral, 2020). The adoption of cloud AI is likely to continue to accelerate across the economy (ABI Research, 2020).

In the short run, cloud-based technologies represent a bright spot in a much gloomier wider economic picture. The majority of investors responding to a survey by 500 Startups, a global VC fund and seed accelerator, believed that COVID-19 will have a negative (32%) or somewhat negative (36%) impact on early-stage investment activity in 2020, with most believing the impact could last between one and two years (500 Startups, 2020).

According to a recent Gartner press release, “worldwide IT spending is projected to total \$3.4 trillion in 2020, a decline of 8% from 2019, according to the latest forecast by Gartner, Inc. The coronavirus pandemic and effects of the global economic recession are causing CIOs to prioritize spending on technology and services that are deemed “mission-critical” over initiatives aimed at growth or transformation” (Gartner, 2020). The adoption of AI has been severely impacted at the device and machine levels, with demand for consumer devices weakened and the adoption of AI-enabled machines in industry and physical retail postponed during the pandemic (ABI Research, 2020).

¹⁸ See ABI Research (2020) and SmartVault (2020) for further details.

5.2 The role of AI

A fall in AI systems spending across multiple sectors in Europe is expected in 2020 (Vernon et al., 2020). Like the wider economy, the technology industry is suffering a recession, with supply disruption and reduced production levels causing challenges for the roll-out of new technology.

Despite the short-term difficulties, the crisis also offers potential for accelerated adoption of AI over the medium term. Before the pandemic, the adoption of AI and data technologies often faced significant cultural and organisational barriers but the rapid change in working patterns during the COVID-19 crisis has accelerated the trend towards wider use of data technologies, such that in eight weeks we have seen a rate of consumer and business digital adoption that would previously have occurred over five years (Baig et al., 2020, p. 19). It has become apparent that, for many companies, incorporating data technologies has moved from “nice to have” to “must-have”. Enterprises that are able to make smart investments in innovation during the current crisis could open themselves up to new opportunities in the future.

Prior to the crisis, 73% of organisations were piloting or adopting AI in one or more business units (Daugherty et al., 2020), and AI could now be an even higher priority. AI solutions have been developed that reconfigure supply chains to improve efficiency (Woodie, 2020); to engage with customers remotely through chatbots; and in public health responses to the pandemic – from viral detection tools to the AlphaFold technology developed by DeepMind, which can predict the virus’s protein structure (Senior et al., 2020).

Organisations which have used the crisis as an opportunity to rapidly adopt AI tools and algorithms have outperformed their peers (Blackburn et al., 2020). McKinsey found that the companies which adopted AI effectively were almost four times more likely than others to have their data analytics strategy aligned with their broader corporate strategy; they argue that this alignment of strategies is key for extracting more value from AI in future (Henke et al., 2020). These early and proven benefits from this adoption of AI and alignment of corporate strategy provides further evidence for the importance and value of these technologies, providing incentive for further AI adoption across the economy.

Many companies have used their existing technological infrastructure to address their main priorities during the pandemic, ranging from engaging with and protecting customers and employees; to managing supply chains and taking strategic decisions. At the same time, some businesses rapidly built new data streams and began to develop long term plans for their use of AI and data technologies (Henke et al., 2020).

Big Data and the Internet of Things could help enterprises by pushing data-driven responses. Greater investment in connectivity would allow more interaction to take place remotely, and lay the ground for future preparedness to pandemics, since flexible technological platforms have been crucial to mitigating the effects of the current crisis.

Despite reduced investment levels in modernization in the short run, IDC are predicting a V-shaped recovery in AI spending (Vernon et al., 2020). One US study found that 75% of people using digital channels for the first time during the pandemic will continue to do so after the crisis (Henke et al., 2020). With Visa reporting an 18% rise in spending on digital commerce in the US (Daugherty et al., 2020) and McKinsey’s UK consumer sentiment survey finding that many UK consumers intend to continue with recently-adopted tools such as professional videoconferencing, remote learning and telemedicine, many of the habits developed during the lockdown period could be here to stay (Gunday et al., 2020).

Insurance

In the insurance sector, underwriting losses for insurers have been estimated at \$107 billion (£85 billion) in 2020 as a result of a surge of COVID-related claims ranging from travel insurance to business interruption, alongside a slump in economic activity causing a fall in sales for insurance across many sectors (Schroff, 2020).

Global InsurTech funding fell by 54% in the first quarter of 2020, marking the first substantial drop after growth in recent quarters (Willis Towers Watson, 2020). Behind the headline figure is a more nuanced story, as the number of new deals increased on the previous quarter, with 10% of global deals taking place in the UK. Despite lots of continued activity in early-stage funding, the COVID-19 crisis has had a profound effect on InsurTech funding.

A crisis for tech startups could pose an opportunity for larger incumbents to step up hiring of those with the advanced technical and data skills. There is an opportunity for incumbents in the insurance sector to form alliances or partnerships with InsurTech startups in order to incorporate more AI, robotics and automation into their businesses. The crisis has underlined the need for insurers to adopt AI in the fields of pricing, underwriting, claims handling, customer interaction and fraud management (Scattaglia Cartago et al., 2020). After the pandemic, the ability of insurers to balance risks more accurately could be crucial. A range of tools including Machine Learning and Natural Language Processing could help to improve underwriting; meanwhile machine vision software can help insurers to establish new customer bases and revenue sources (Schroff, 2020).

Many incumbent insurers lacked internal innovation and were ill-prepared for the crisis. As a result, many of the first-time insurance buyers entering the market since the start of the crisis are opting for alternatives (Insurtech Channel, 2020). Insurtechs like Getsafe, which had expanded to the UK in January, are experiencing higher levels of interest than normal (InsurTech Channel, 2020).

The huge databases of incumbent insurers remain largely untapped – one study found that insurers only process 10-15% of the available data (Malhotra & Sharma, 2018). Smart investment in AI now could combine this untapped potential with the innovative technologies developed by InsurTech startups to reap rewards in the future. Incumbents may step up direct investments in-house going forward. In either case, much of the investment in insurance innovation is expected to be on fraud detection and speeding up claims processing (GlobalData, 2020). Fraudulent claims could be on the rise as a result of the economic hardship suffered by individuals and businesses, as was the case following the global financial crisis in 2008/09 (Toomey, 2020).

While the short-run financial impact on the insurance industry looks to be profound, it seems likely that the trends towards digitalization and AI adoption could be accelerated as the sector recovers from the initial shock of the COVID-19 crisis.

Accountancy

Like other sectors across the economy, accountancy has benefited from cloud-based technology during the transition to remote working. One report found that most accountants agreed that COVID-19 has acted as a forcing mechanism to get firms and clients to embrace cloud-based technologies. 63% of firms with a cloud-based document management system felt that they had handled the impact of COVID-19 well and had made a seamless transition to remote work, compared with only 31% of firms who had no cloud-based systems in place feeling they had made a seamless transition to remote work. At a time of lockdown and remote working for many, the biggest challenge reported by 62% of firms was keeping clients informed. 80% of firms identified as “most

successful” offered online client portal access, compared to 55% of “least successful” firms (SmartVault, 2020).

Technology has become vital for many accounting businesses. The current crisis has accelerated the trend of digitalization and the adoption of data technologies within the accounting sector that the government’s Making Tax Digital had cemented (Moyer, 2020).

Little evidence on the impact of COVID-19 on uptake of AI and data technologies within the UK accountancy sector was available at the time of writing. However, evidence from the US suggests that accountants see AI and data technologies as important and impactful ecosystems, with 73.6% of accountants surveyed adding additional tech solutions into their business since the pandemic. Additionally, AI and Automation were considered by accountants to be the most impactful tech for the business finance ecosystem in 2020 (Arrowsmith, 2020).

Law

Similarly, the restructuring taking place across the legal sector has been made more urgent by the COVID-19 crisis. As a leader in the global legal services market, the UK has a strong foundation on which to lead the legal services sector’s digital transformation, and the COVID-19 crisis has shown the industry’s ability to respond. The UK government has recognized the importance of this transformation and has offered some support to LawtechUK, a collaborative initiative between Tech Nation, the Lawtech Delivery Panel and the Ministry of Justice. The government’s £2 million of funding aims to help LawtechUK in its work supporting the UK legal sector’s digital transformation (Tech Nation, n.d.).

With the prospect of months of delays to trials and the closure of courts, the UK Justice Ministry limited court hearings and encouraged the use of technology. Britain’s supreme court, for the first time in its history, started conducting cases entirely by video link (Hussain, 2020). In the access to justice sector, a multifaceted debate is developing around the use of digital technologies, and the possibility of a bespoke digital communications mechanism (Etic Lab, 2020). New AI-based systems could help in access to justice and the use of technologies ranging from cloud computing to Machine Learning and digital Case Management Platforms could all be used to build technology-friendly justice systems.

With digitalisation trends already underway before the pandemic, the crisis has exemplified the need for data technologies and highlighted the relative success of firms who were digitally better prepared. Collaborations and innovation in accountancy and legal services could lead to further adoption of data technologies and AI, spurred on by the rise of cloud-based services and the frameworks for AI adoption that such services provide.

5.3 Industry views on the impact of COVID-19

A follow-up survey was administered to understand how firms viewed the current and potential impact of COVID-19 on AI and data technologies. 40 respondents were surveyed, this sample was comprised of AI related startups, research organizations and other firms which stood to be affected (see Annex 5 for a breakdown).

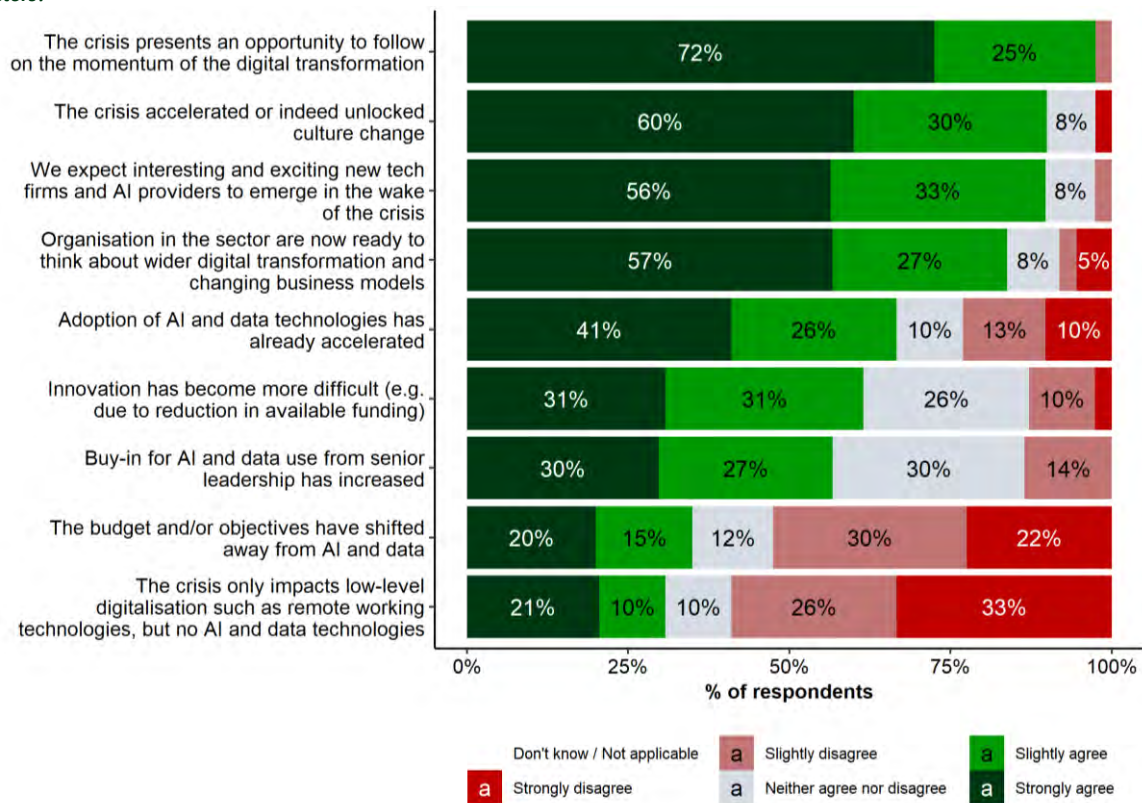
The survey findings confirm literature evidence that the impact of COVID-19 on adoption of AI and data technologies in the services sector is likely to be negative in the short-term, but also presents potential opportunities for accelerated adoption of AI over the medium term. Specifically, **97% of survey respondents agreed that the crisis presented an opportunity to follow on the momentum**

of digital transformation; 90% also agreed that the crisis accelerated culture change and that they expected new tech firms and AI providers to emerge in the wake of the crisis.

In addition to the increased difficulty of obtaining funding, discussed earlier in this section, the majority of respondents felt that innovation had become more difficult (with 62% of respondents agreeing that it had). There was also less unanimous agreement that buy-in for AI and data use from senior management had increased, with only 57% of respondents indicating that it had, 30% neither agreeing nor disagreeing, and 14% disagreeing.

Figure 27 Survey respondents’ views on the impact of COVID-19 on adoption of AI and data technologies within the services sector

Do you agree with the following statements on the impact of COVID-19 on adoption of AI and data technologies within the services sectors?



Note: No. of responses: 37 - 40 Source: London Economics

Further detail provided by respondents suggested that while they believe COVID-19 will lead to acceleration of AI uptake from an increased focus on digitalization over the long term, in the short-term reduced investment from incumbent firms in AI and data technologies is likely. Respondents felt that investment was likely to slow and become more difficult to access for AI and tech firms and startups, mirroring literature evidence provided earlier.

Moreover, while only 35% of respondents agreed that budgets had shifted away from AI, qualitative evidence provided by respondents suggests that many felt that incumbents were increasingly focusing on stabilising core business areas, with investments in new AI projects slowed or postponed. This reduction in demand is likely to put additional pressure on AI firms in the short-term, and provides further evidence on the short-term difficulties faced by firms innovating in the sector.

Increased demand and financial pressures may also lead to a slowdown innovation and development. This presents an opportunity for established solutions providers, who may be able to gain market shares and strengthen their hold on the market. Moreover, short-term loss in business for AI and data related startups may represent an opportunity for an increase in acquisitions of failing startups by incumbent firms. Further adoption of AI and data may therefore be driven by consolidation of firms in the market as well as acquisitions strengthening in-house talent, skills and tools available for incumbent firms.

Nevertheless, over the medium to long term, respondents believed that there will be increased uptake and adoption of AI and data technologies. One incumbent law firm commented that COVID-19 has led to an acceleration in their transformation towards increased digitalisation and incorporation of new technologies, and that this will result in an increased level of adoption of AI and data technologies for the firm in the future. While there is significant uncertainty over future trends, evidence from the survey further highlights the potential medium to long-term opportunities for AI uptake following the crisis.

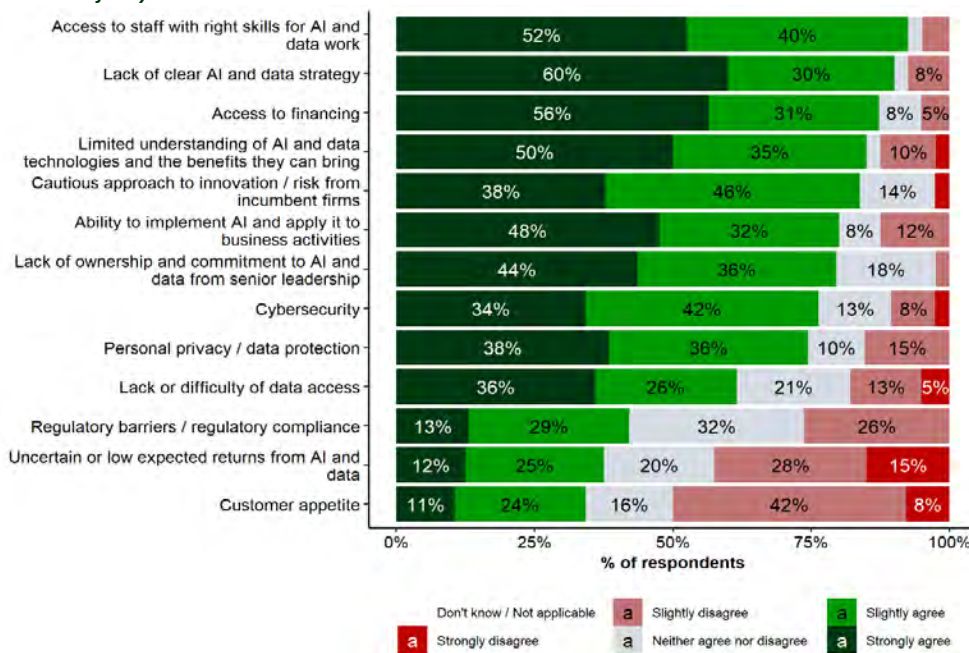
Challenges and Opportunities

Figure 28 shows respondents’ views on the key challenges for adoption of AI and data technology within the next three to four years. **Respondents strongly agreed that access to staff with right skills, access to financing and a lack of clear AI strategy are major challenges going forward, with agreement rates of 92%, 87% and 90% respectively.**

Other challenges such as a limited understanding of AI, the ability to implement AI, and cybersecurity were also seen as key challenges to the adoption of AI. **However, fewer respondents felt that regulatory barriers, customer appetite and uncertain expected returns of AI would be key challenges, with agreement rates of only 42%, 35% and 37% respectively.**

Figure 28 Survey respondents’ views on the key challenges to adoption of AI and data technologies within the services sectors over the next three to four years

Which of the following do you see as key challenges to the adoption of AI and data technologies within the services sectors over the next three to four years?



Note: No. of responses: 37 - 40 Source: London Economics

These results broadly mirror the survey responses received to the original survey (see Section 4.2). This suggests that industry’s views on the major challenges faced by the sector have not majorly shifted as a result of COVID-19. However, it is worth noting that a higher proportion of respondents now agree that cybersecurity and data protection are key challenges. These increased security concerns may be a result of the unprecedented levels of home working and the cybersecurity issues presented by this new way of working.

One AI and data technology startup commented that closing sales has become more difficult, with negotiations becoming more protracted. Some customers are now more than ever focused on reducing costs and improving efficiencies. In the current crisis firms are understandably more reluctant to undertake non-essential spending. However, there may come a point where firms feel that the benefits AI can provide outweigh the risks and tech firms will need to be ready to take advantage of this opportunity when it arises.

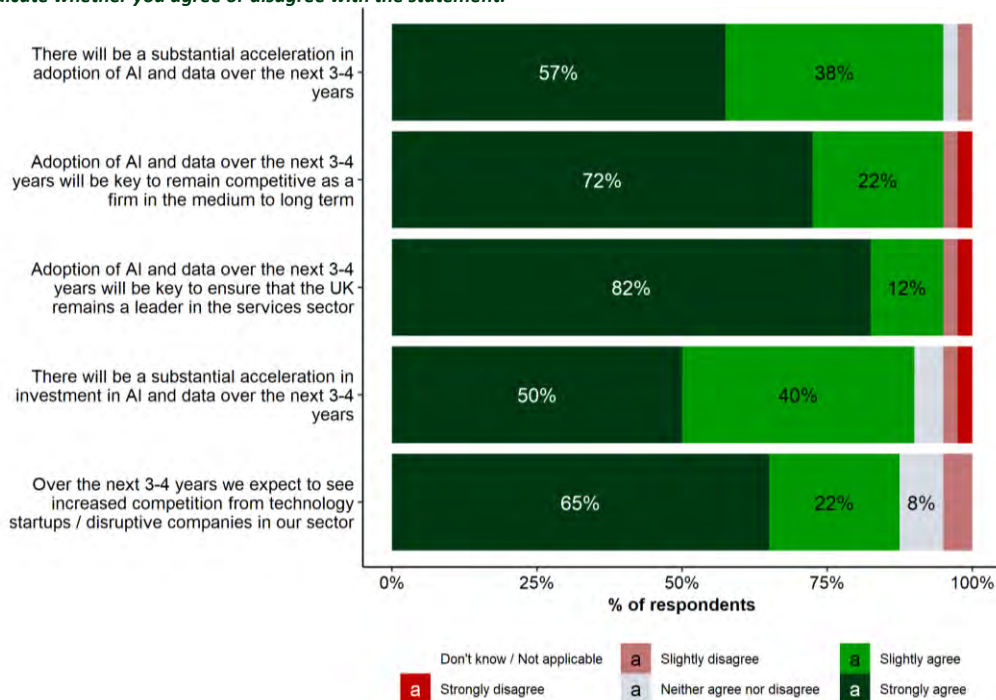
Indeed, overall respondents believed that an increased focus on improving operational efficiencies and reducing cost as a result of COVID-19 will continue to encourage further uptake and adoption of AI and data in the future. As firms continue to look to improve productivity, AI and data technologies may be pathways to achieve this.

Future uptake

Respondents responded much more positively regarding the role of AI and data than previously, with **94% of respondents now agreeing that adoption will be key to ensure the UK remains a leader in the services sector (up from 88%)**. Additionally, a greater proportion of respondents agree that there will be a substantial acceleration of investment (90%, up from 85%), acceleration in adoption (95%, up from 88%) and increased competition from technology startups (87%, up from 79%).

Figure 29 Survey respondents’ views on the future uptake of AI and data technologies

Thinking about the use of AI and data technologies, over the next three to four years, in the services sectors, for each statement please indicate whether you agree or disagree with the statement.



Note: No. of responses: 40 Source: London Economics

6 Recommendations

AI and data technologies have far-reaching economic effects and provide significant opportunities for the UK services sector. Services are a traditional area of strength for the UK and the sector is in a good position to benefit from AI and data technologies. Nevertheless, use of AI is often restricted to experimental projects or use in some limited business functions. Moreover, there are a number of challenges facing UK companies, and areas where the UK could improve. These include translating research into commercial products and services; scaling up innovative companies; improving access to funding, skilled labour and the wider ecosystem; as well as structural features of the sector.

The current COVID-19 crisis has significantly accelerated the pace of digital transformation. Many businesses that were previously hesitant are now actively embracing digital technologies to carry on working remotely and stay operational. As a result, there is an increased engagement and interest in technology. It is too early to tell how much of a lasting impact the crisis will have on technology adoption, or indeed whether accelerated adoption of technologies in the wake of the crisis will also lead to an acceleration in uptake of advanced AI and data technologies. However, what is clear is that the crisis presents a significant opportunity for adoption of AI and data technologies and indeed changing ways of working as well as developing new business models.

Against this background, this study provides concrete steps Government, support organisations, incumbent firms and innovators in the sector can each take to ensure the UK's services industry reaps the maximum benefit from AI and data:

Recommendation 1: Continue to tackle the funding and skills challenges

Recommendation 1.1: Incumbent firms should continue to focus on upskilling and reskilling

Recommendation 1.2: Policy makers and sector bodies should create policies that are targeted at meeting the skills requirements of the future

Recommendation 1.3: Government should address the scale-up challenge as a matter of priority

Recommendation 2: Make data fit for innovation

Recommendation 2.1: Regulators and tech providers should work on creating data standards and common interfaces

Recommendation 2.2: Incumbents should upgrade their data infrastructure

Recommendation 3: Foster an innovation culture

Recommendation 3.1: Incumbents should consider whether their current organisational structures are conducive to innovation

Recommendation 3.2: Firms should think carefully about the problems they face and avoid innovating for innovations' sake - sometimes much simpler solutions are more appropriate for the problems at hand than advanced AI techniques

Recommendation 4: Create meaningful partnerships

Recommendation 4.1: Incumbents should be transparent about the challenges they are facing and open to solutions from outside their organisation

Recommendation 4.2: Innovators need to recognise the difficulty in evaluating potential AI solutions for incumbents and be clear about the value their solution brings

Recommendation 4.3: Policy bodies and support organisations should continue to promote partnerships and knowledge transfer

Recommendation 5: Create regulation that is conducive to innovation

Recommendation 5: Government and regulators should work with industry to ensure that inadequate regulation, or indeed a lack of regulation, does not hinder innovation

6.1 Tackling the funding and skills challenges

Despite the UK's comparatively strong AI and data ecosystem, access to funding and staff with the right skills continues to be a particular challenge faced by startups and incumbent firms alike. The funding and skills challenges have been consistently identified as key barriers to adoption of advanced technology in various studies over the last few years. It is therefore not surprising that they were also identified as key challenges for adoption of AI and data in the services sector.

Addressing the skills challenge has therefore rightly been at the forefront of Government policy making; for example, in its industrial strategy which aims to help young people develop the skills they need to do the high-paid, high-skilled jobs of the future. However, it is important to note that it is not only trained data scientists and AI professionals that are required. More and more an understanding and appreciation of digital technologies is also required among lawyers, insurance professionals and accountants in order to exploit AI/data.

Similarly, a number of Government and private funding schemes as well as acceleration and incubation initiatives to address the funding challenge by helping innovative startups already exist. However, accessing funding remains a particular challenge faced by many companies seeking to scale, with scale-ups needing larger funds than startups, but fewer investors able to provide follow-on investments at later stages. It is therefore no surprise that scale-up challenges are also affecting AI and data companies in the services sector. Indeed, in the wake of the current COVID-19 crisis, funding poses an even more significant challenge for startups and innovators seeking to scale-up.

It is therefore crucial that the government as well as firms in the sector continue to take these challenges seriously. In particular, the following recommendations should be considered.

Recommendation 1.1: Incumbent firms should continue to focus on upskilling and reskilling

To fully exploit the potential opportunities AI/data can bring, it is imperative for all actors to continue to focus on upskilling and reskilling. For incumbents, this means investing in the skills of current staff, including those in traditional professional service roles, to ensure their workforce has an appreciation of, and skills to, utilise digital technologies and recognise where in their work it could add value. At the same time, firms should not only focus on skills development in isolation, but also on creating an environment that is conducive to utilising these skills in the right way in order to derive value. Investments in skills need to be complemented by investments in data infrastructure (Recommendation 2) and business processes and culture (Recommendation 3) to derive the most value.

Recommendation 1.2: Policy makers and sector bodies should create policies that are targeted at meeting the skills requirements of the future

For policy makers and sector bodies, this means to continue to take the skills challenge seriously and to create policies that are targeted at meeting the skills requirements of the future. It also means working with education providers to ensure the workforce has the skills needed to exploit existing and future digital technologies. However, focus should not only be placed on increasing the number of skilled data-scientists but also on building digital skills among the lawyers, accountants and insurance professionals of the future to ensure that the career paths of lawyers and accountants are resilient in the face of technology change through an adaptive education and training system. Indeed, some universities have already started to integrate AI and digitalisation courses into their

curriculum, while support organisations are focusing on skills development. This is a good start and continued effort will be required.

Recommendation 1.3: Government should address the scale-up challenge as a matter of priority

Government innovation support for innovative AI and data startups can be justified on efficiency grounds. At the same time, it is important to not forget about the challenges these companies will face once they have obtained first customers and seeking to scale-up. A number of recent reports have examined the scale-up challenge. These include the 2019 Scale-up UK: Growing Businesses, Growing our Economy study by Barclays and Cambridge Judge and Oxford Said business schools (2019) and the ScaleUp Institute's (2019) annual ScaleUp review. Recommendations made by these studies should be implemented as a priority in order to overcome the scale-up challenge.

6.2 Making data fit for innovation

Data often remains captured in structures that are not conducive to exploiting AI and data technologies. This includes hand-written documents and documents stored in folders, but also data saved in legacy systems that do not integrate with other technologies, and data 'silos' that are not shared across business functions. This creates significant barriers to deriving value from AI and data technologies, as a modern fit-for-purpose data infrastructure in many ways forms the groundwork on which AI and other data technologies build. In addition, there is a lack of common standards and interfaces for AI and data technologies, meaning that one solution often is not interoperable with other solutions. The following recommendations should therefore be considered to make data fit for innovation.

Recommendation 2.1: Regulators and tech providers should work on creating data standards and common interfaces

Data standards and common interfaces will allow companies to access multiple solutions and not be locked into their chosen provider. They also provide innovators the opportunity to access data as well as to interface with other solutions. Regulators and tech providers should therefore work on creating common data standards and interfaces.

Recommendation 2.2: Incumbents should upgrade their data infrastructure

For firms seeking to adopt AI, it is imperative that investments in skills are complemented by investments in the right data infrastructure to derive the most value of AI and data technologies. Firms that have not done so already should, as a first step, focus on upgrading their data infrastructure and lifting data assets out of legacy systems and data 'silos'. Only by doing the groundwork and thinking about how existing data and structures can be transformed will firms be able to realise the full benefits of AI and data technologies.

6.3 Fostering an innovation culture

Many incumbent firms are already investing in AI and data; have experimented with AI and data technologies; or, at least, are planning to do so in the near future. This is encouraging. However, in order to extract the most value from AI and data technologies, more than just isolated experiments are required. Unsurprisingly, tech firms and solutions providers consulted for this study saw the most value being derived when firms, and in particular senior decision makers, were committed to exploiting AI and data across their business functions and had a solid AI and data strategy in place.

However, a number of studies have highlighted that existing business models and structures in the services sector, such as the partnership model, may not be conducive to innovation. Moreover, while many incumbent firms have innovation or technology officers, they often do not make the decisions on what to adopt or invest in. In some cases, there may also be cultural factors preventing adoption, such as a reluctance to explore new technologies or a limited understanding of digital technologies, particularly among senior decision makers. In light of this, fostering a culture that is conducive to innovation will be key for incumbents seeking to derive the most value from AI and data technologies.

Recommendation 3.1: Incumbents should consider whether their current organisational structures are conducive to innovation

Incumbents should consider whether their current organisational structures are conducive to innovation and will serve them over the long term. For example, incumbents should consider where innovation sits within their organisation and whether this is the most effective place to derive value from innovation; whether their current innovation strategy is fit for purpose (or indeed if they do not have one whether they should put one in place); as well as, whether their institutional model supports innovation. Firms should also be open to explore the possibility of business model change and explore whether new institutional models could be more conducive to innovation and their long-term success.

Recommendation 3.2: firms should think carefully about the problems they face and avoid innovating for innovations' sake - sometimes much simpler solutions are more appropriate for the problems at hand than advanced AI techniques

While advanced AI and data technologies bring many benefits, incumbents should not be blinded by 'shiny and new' technology and avoid innovation for the sake of innovation. We believe the best way to derive value from AI and data technologies is to think about what the key problems and challenges that an organisation is facing are, and how technology could help solve these problems. Sometimes much simpler solutions are more appropriate for the problems at hand than advanced AI techniques.

6.4 Creating meaningful partnerships

While the UK is home to many innovative startups in the services sectors, many startups find it very difficult to access incumbent firms, creating an additional challenge for startups seeking to gain market traction. On the other hand firms seeking to adopt often face significant challenges in exploiting the value of AI and data due to a number of barriers; for example a difficulty in hiring people with the vision and skills equipped to take full advantage of AI and data technologies.

Recommendation 4.1: Incumbents should be transparent about the challenges they are facing and open to solutions from outside their organisation

Firms do not need to solve their challenges on their own; partnerships can be a great way to tackle challenging problems. However, to create meaningful partnerships, incumbents need to be transparent about the challenges they are facing and open to solutions from outside their organisation, including from tech startups.

Recommendation 4.2: Innovators need to recognise the difficulty in evaluating potential AI solutions for incumbents and be clear about the value their solution brings

At the same time, innovators need to recognise the difficulty for incumbents to evaluate whether a solution will benefit them or not. Too often products do not live up to expectations, or only work for a narrow problem. This, combined with the number of companies offering solutions and the hype that continues to surround AI and data technologies, means the landscape can be confusing for incumbent firms, and knowing which products will deliver real benefits for them can be difficult. Therefore, innovators also need to ensure that they know their market and their competitors, and be clear about the problems their target audience is facing and the value their solution brings to incumbent firms.

Recommendation 4.3: Policy bodies and support organisations should continue to promote partnerships and knowledge transfer

Support organisations such as the KTN and Innovate UK should continue to help connect startups and incumbent firms. Support organisations and policy bodies also need to be aware that access challenges are not only present between innovators and incumbents but also between commercial firms and the research community. While the UK has an excellent AI and data research base, it is not as good at translating research into commercial products and services, thus creating a gap between academic research and commercial applications. A thorough analysis of how to bridge these divides goes well beyond the scope of this study. However, what is clear is that policy bodies and support organisations should continue to promote partnerships and knowledge transfer between industry and academia, as well as, incumbents and innovators; and examine if existing institutions work as intended or could be improved. At the same time the onus is not solely on public bodies and the Government, but also on research institutions, innovators and commercial firms to productively engage with each other and facilitate knowledge exchange.

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ANNEXES

Annex 1 Index of Tables and Figures

Tables

Table 1	High-level comparison of current state of AI and data in the accountancy, insurance and legal services sectors	76
Table 2	AI/data accelerators and incubators	77
Table 3	Identified VC and seed funders with a specialisation in AI and data tech	78
Table 4	Distribution of interviews conducted	79

Figures

Figure 1	Sectoral split of identified companies	5
Figure 2	Location of identified companies	5
Figure 1	Contribution of accountancy, legal and insurance services to UK economy	10
Figure 2	Number of AI publications between 2015 and 2018	16
Figure 3	Number of AI citations between 2015 and 2018	16
Figure 4	UK AI and data strengths as seen by survey respondents	17
Figure 5	Survey respondents' views on AI and data research among UK universities	17
Figure 6	Number of AI patent publications between 2015 and 2018	18
Figure 7	Number of AI patent citations between 2015 and 2018	18
Figure 8	AI and data clusters across the UK	20
Figure 9	Private investment in AI (£ bn, 2019 prices)	21
Figure 10	Government AI Readiness Index	22
Figure 11	Sectoral split of identified companies	23
Figure 12	AI & data tech firms/startups in the accountancy, insurance and legal services sectors	24
Figure 13	No. of UK AI and data tech startup formations over time	25
	Market shares of largest accounting practices, 2016-17	26
Figure 14	AI and data companies in the accountancy sector, by segment	28
Figure 15	Non-life insurance premiums written by largest insurers, 2017	29
Figure 16	AI and data companies in the insurance sector, by segment	30
Figure 17	Revenues of largest law firms, 2018/19	33
Figure 18	AI and data companies in the legal sector, by segment	34

Figure 19	Strengths and weaknesses of the UK AI and data ecosystem, and opportunities for and threats to adoption with the services sector	37
Figure 20	Drivers of innovation as seen by survey respondents	41
Figure 21	Survey respondents' views on challenges to adoption of AI and data	42
Figure 22	Challenges among AI and data startups/SMEs responding to the survey	43
Figure 23	Collaboration among AI and data startups/firms responding to the survey	44
Figure 24	Collaborations among IT and consultancy firms responding to the survey	44
Figure 25	Impact of collaborations among survey respondents	45
Figure 26	Survey respondents' views on future trends in the services sectors	48
Figure 27	Survey respondents' views on the impact of COVID-19 on adoption of AI and data technologies within the services sector	56
Figure 28	Survey respondents' views on the key challenges to adoption of AI and data technologies within the services sectors over the next three to four years	57
Figure 29	Survey respondents' views on the future uptake of AI and data technologies	58
Figure 30	Survey respondents by type	79
Figure 31	Sectoral split of survey respondents	80
Figure 32	Target audience of AI/data startups and SMEs responding to the survey	80
Figure 33	Target sectors IT and consultancy firms responding to the survey	80
Figure 34	Geographical distribution of survey respondents	81
Figure 35	Role of survey respondents	82

Annex 2 Comparison of AI and data in the insurance, legal and accountancy services sectors.

Table 1 High-level comparison of current state of AI and data in the accountancy, insurance and legal services sectors

	Accountancy	Insurance	Legal
Size and maturity of startup ecosystem	Newest segment with fewer companies identified (more than three times as many InsurTechs and nearly twice as many LegalTechs were identified). Highlighted by the fact that AccounTech has not established itself as a term yet.	Most mature and longest established ecosystem, with InsurTech’s accounting for nearly half of identified tech companies.	Newer and less mature segment compared with InsurTech. Overall, less activity, by number of companies (nearly twice as many InsurTechs identified). However, segment is establishing itself well with still a significant amount of activity identified.
Areas of innovation	Significant activity focused on innovative accountancy software, particularly cloud accounting. Other areas of innovation include cashflow management, invoicing and expense management solutions; tax and payroll services; as well as document, workflow, and practice management solution.	Segment split into disruptors, providing more consumer focused, personalised, or simpler insurance, with rise in on-demand and peer2peer insurance; and, growing number of companies providing services to insurers such as for risk assessment/management (e.g. new data from IoT sensors), predictive analytics, claims and underwriting solutions, among others.	Many solutions focused on delivering efficiencies. Examples include solutions for practice management, legal research and document review / creation. Few true disruptors identified, though significant activity also around consumer solutions seeking to improve access to justice.
Startup support ecosystem	Only one accelerator focusing on AccounTech was identified, no specialist funders identified.	Specialist accelerators and incubators exist, both from incumbent players (e.g. AXA Next, Lloyd’s Lab) as well as independent specialist incubators (e.g. InsurTech Gateway). Moreover, a number of funders focusing on InsurTech were identified.	Specialist accelerators and incubators exist, though mainly through incumbent players (e.g. MDR Lab, Slaughter and May Collaborate). A number of funders focusing on LegalTech were also identified.
Adoption among incumbents	Big 4 and some other large firms actively using and investing in AI. Many other accounting firms also interested in, and have started, or are planning to start adoption of, AI and data technologies, suggesting that automation is taking shape. However, widespread full-scale uptake across all areas of the business also remains low at this stage.	Growing interest in AI and data, with large proportion of insurers investing in or planning to invest in AI and data, and AI and data increasingly part of insurers business models. Full-scale uptake of AI and data across all areas of the business remains low. COVID-19 sparking increased interest in AI-powered risk management solutions.	Adoption mixed with major law firms as well as many mid-sized firms using or at least experimenting with using, some form of AI in their business and many major law firms having set-up acceleration programmes; but uptake among law firms themselves concentrated on established technologies.

Source: London Economics

Annex 3 AI/data accelerators and incubators

The table below provides a list of identified accelerators and incubation programmes for AI and data technologies within the insurance, legal, and accountancy services sectors:

Table 2 AI/data accelerators and incubators

Sector	Company	Type	Geographical reach
Insurance	InsurTech Gateway	Accelerator	London
Multiple incl. AI and insurance	Founders Factory	Accelerator	Global
Insurance	Startupbootcamp InsurTech London	Accelerator	London
Insurance	Synechron	Accelerator	Global
Insurance	Lloyd's Lab	Accelerator	Global (but visits to London required)
Insurance	AXA Next	Incubator / investor	US, China, London
Multiple incl. insurance and Law	PwC Scale Programmes	Accelerator	Nationwide; separate programmes for Yorkshire and the Southeast (insurance programme based in London)
Fintech incl. insurance stream	Accenture FinTech Innovation Lab	Accelerator	London
Multiple incl. legal and InsurTech	SeedCamp	Seed fund/ accelerator	Global (Europe focused)
Multiple incl. insurance and law	Entrepreneur First	Incubator / Investor	Europe & Asia (including London)
Law	Barclays Eagle Lab	Incubator ('Post-accelerator')	London
Law	MDR Lab	Accelerator	London
Law	Slaughter and May, Collaborate	Incubator	London
Law	Allen & Overy, Fuse	Incubator	London
Law	Mishcon de Reya, M:Tech	Incubator / Accelerator	London
Accounting	Association of International Certified Professional Accountants startup accelerator	Accelerator	Global (but visits to US required)
General AI and Data	Data Pitch	Accelerator	Europe
General AI and Data (including verticals in law and fintech)	Wayra, AI & Blockchain Accelerator	Accelerator	UK (Scottish preference)
General AI and Data (including verticals in law and fintech)	Technation	Accelerator	UK (Scottish preference)

Source: London Economics

Annex 4 Funders with a specialisation in AI and data tech

The table below shows identified VC and seed funders with a specialisation in AI and data tech.

Table 3 Identified VC and seed funders with a specialisation in AI and data tech

Investor name	Sector focus	Type
72 Capital Limited	Technology and Sports	Adviser
AI.Seed	AI and ML	Seed & VC Investor
Amaedus Capital Partners	Multiple incl. AI and machine learning, Insurtech	VC Investor
Atomico	Technology	VC Investor
Breed Reply	IoT	VC Investor
Bright Minds Capital Partners	Law	VC Investor/Evergreen fund
Eos Venture Partners	Insurance	VC Investor
IQ Capital	Multiple incl. Deep tech, AI and Machine Learning, Legal	Seed & VC Investor
LocalGlobe	Technology	VC Investor
Midven	Multiple incl. AI and software	VC Investor
Octopus Ventures	Deep tech	Seed fund & VC Investor
Parkwalk Advisors	Multiple incl. AI and big data	VC Investor
SeedCamp	Multiple incl. Legal and Insurtech	Seed fund/ accelerator
Talis Capital	Multiple incl. insurance	VC Investor
UFP Fintech	Fintech, Proptech, Legaltch	VC Investor

Source: London Economics

Annex 5 Stakeholder consultations

This section provides an overview of the number of interviews conducted for this study (A5.1) as well as responses received to the online survey (A5.2).

A5.1 Interviews conducted

In total 20 interviews with stakeholders across the insurance, legal, and accountancy services sector were carried out. The table below provides an overview of the split of interviews by type of stakeholder and across the three services sectors.

Table 4 Distribution of interviews conducted

Stakeholder	Insurance	Law	Accountancy	Total
Professional body / support organisation	1	3	1	5
Research organisation	1	2	0	3
Incumbent Firm	1	3	1	5
AI and data startup/firm	3	3	1	7
Total	6	11	3	20

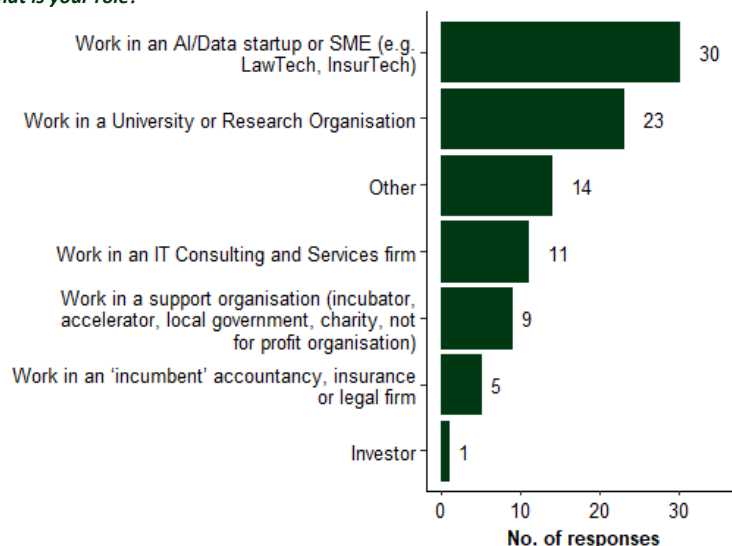
Source: London Economics

A5.2 Survey responses received

In total 93 responses to the survey were received so far. The graph below provides a breakdown of the number of responses received by respondent type.

Figure 30 Survey respondents by type

What is your role?



Note: No. of responses = 93

Source: London Economics

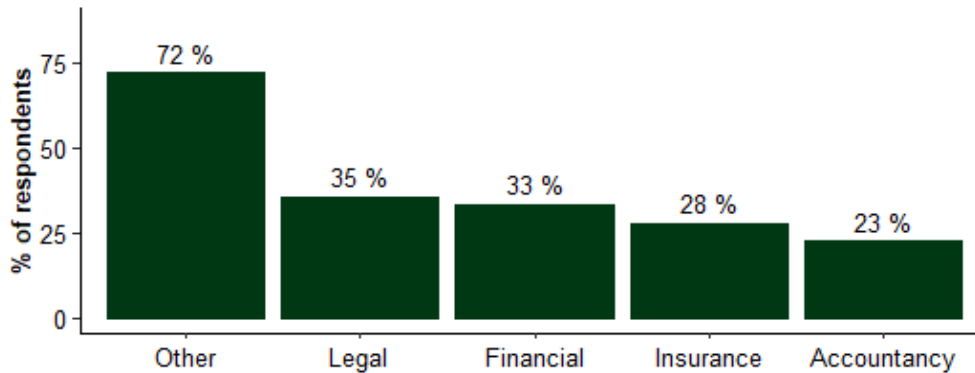
Of the 93 respondents, 47 are involved in one or more of the accountancy, legal or insurance services sectors. A further 7 respondents, who are not involved in the three services sectors, are involved in the wider finance sector. Lastly, 39 respondents are from other sectors, outside the

accountancy, insurance, legal, and financial services sector. These include 14 respondents from universities or research organisations; 10 AI/data startups or SMEs outside the services and finance sectors; as well as, IT/data consultancies, support organisations, and a small number of firms from other sectors.

The graph below shows which sectors respondents are involved in. Note, that respondents were able to select multiple sectors.

Figure 31 Sectoral split of survey respondents

Please tick all the sectors that your company is involved in:



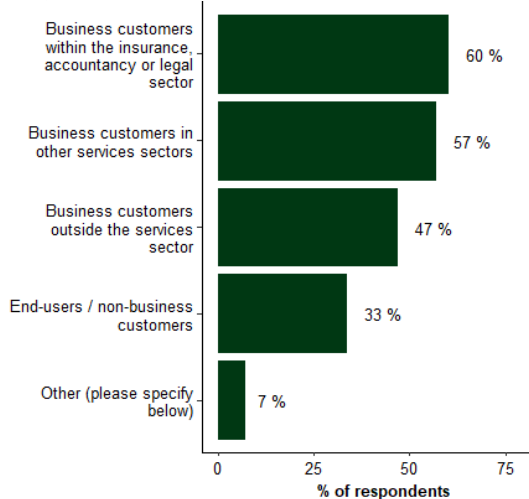
Note: No. of responses = 93

Source: London Economics

The graphs below provide further details about the target audience of AI and data startups/SMEs, and IT and consultancy firms responding to the survey.

Figure 32 Target audience of AI/data startups and SMEs responding to the survey

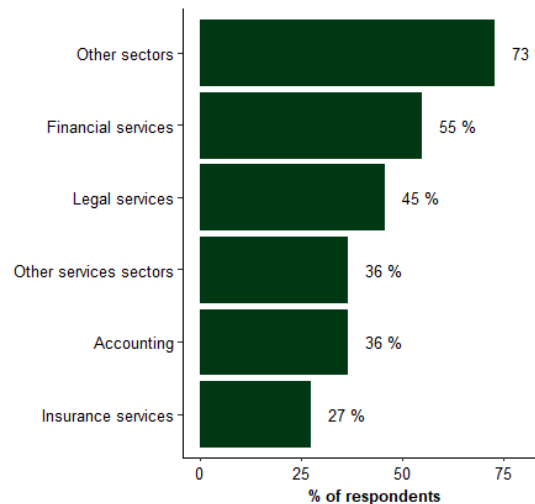
Who is your main target audience?



Note: No. of responses = 30

Source: London Economics

Figure 33 Target sectors IT and consultancy firms responding to the survey



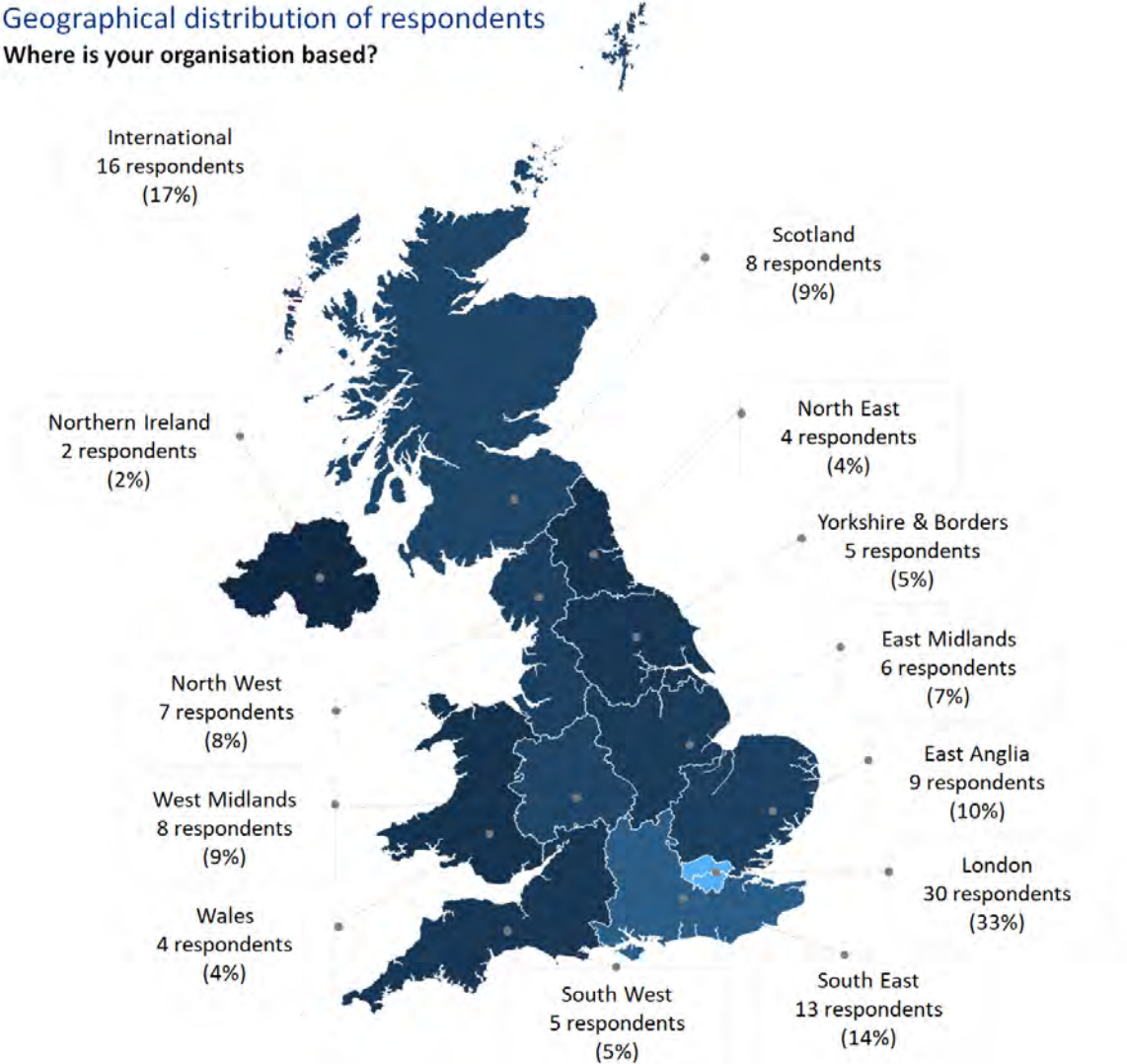
Note: No. of responses = 11

Source: London Economics

Lastly, the graph below shows the geographic locations where respondents have offices. 1 respondent(s) did not provide details on where their organisation is based.

Of the 92 respondents, 24 have UK offices only in London. Of these, 5 have offices also internationally. 54 have UK offices only outside of London; and, 6 have UK offices both in and outside of London. 8 respondents are overseas respondents who have no offices in the UK.

Figure 34 Geographical distribution of survey respondents



Note: No. of responses = 92
Source: London Economics

The survey results should be seen in light of the above-described characteristics. Specifically, the reader should keep the following points in mind:

- The survey received a very small number (5) of responses from incumbent firms.
- A relatively large number of respondents (39 out of 93) are not directly involved in the accountancy, insurance, legal or finance services sectors (these are respondents from academia, support organisations, AI/data firms outside the four services sectors, as well as consultancies and a small number of firms from other sectors).

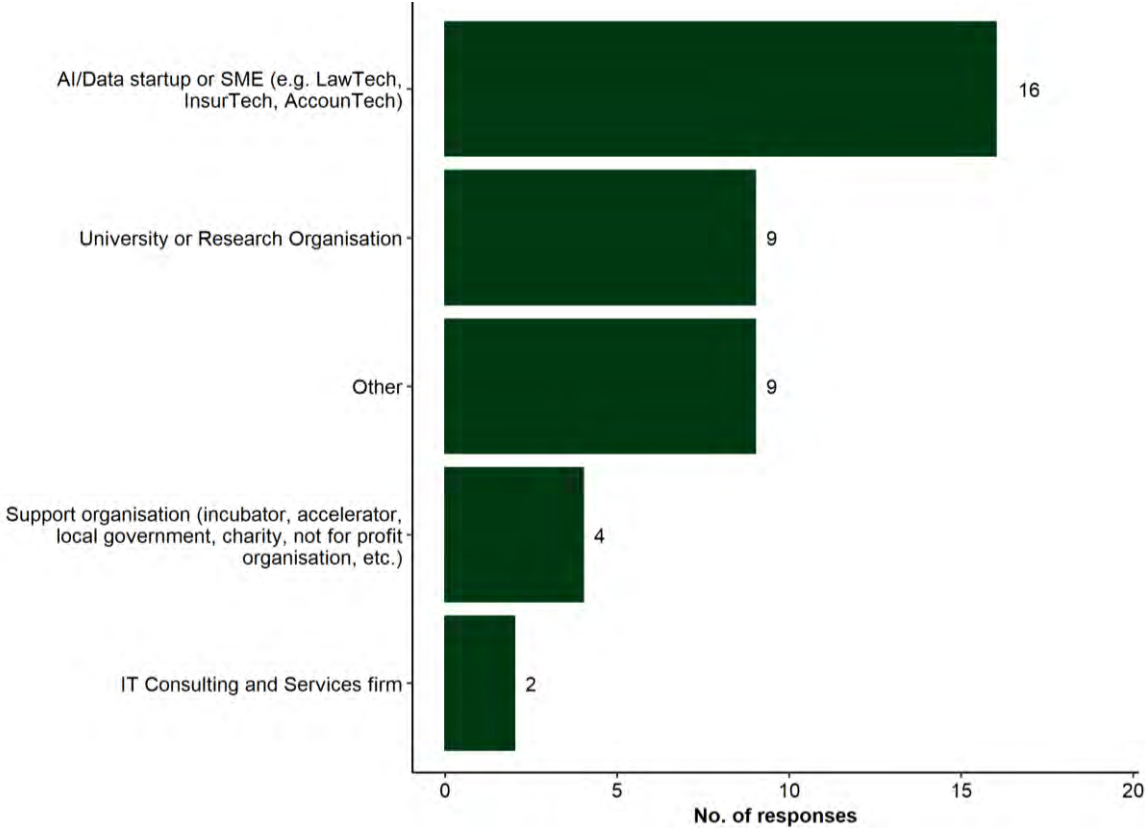
Some respondents (8 out of 93) are respondents from overseas without a UK office.

A5.3 Follow-on survey responses received

A follow-up survey was administered to understand how firms viewed the current and potential impact of COVID-19 on AI and data technologies. 40 respondents were surveyed, this sample was comprised of AI related startups, research organizations and other firms which stood to be affected. The figure below provides a breakdown of responses received.

Figure 35 Role of survey respondents

What is your role?



Note: No. of responses: 40. Source: London Economics



Somerset House, New Wing, Strand,
London, WC2R 1LA, United Kingdom
info@londoneconomics.co.uk
londoneconomics.co.uk
[@LondonEconomics](https://twitter.com/LondonEconomics)
+44 (0)20 3701 7700