

Understanding the UK AI labour market: 2020

Technical report

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Contents

1 Overview	1
1.1 Summary of methodology	1
2 Scoping research	3
2.1 Rapid evidence review	3
2.2 AI Taxonomy to build sample for the quantitative survey	3
2.3 Industry expert interviews	4
3 Quantitative Survey	6
3.1 Survey and questionnaire development	6
3.2 Fieldwork	6
3.3 Fieldwork outcomes and response rate	8
3.4 Data processing and weighting	10
3.5 Workforce-level estimates within the surveyed firms only	10
3.6 Rounding of percentages from the survey estimates	10
4 Qualitative research	11
4.1 Overall breakdown of interviews	11
4.2 Sample quotas	12
4.3 Recruitment approach	13
4.4 Fieldwork	14
4.5 Analysis	15
4.6 Interpreting qualitative findings	15
5 Job vacancies analysis	16
5.1 Search approach	16
5.2 Metrics analysed	18
5.3 Strengths and limitations of this approach	18
6 Recommendations workshop	20
7 Acknowledgements	21
Appendix A: questionnaire	22
Appendix B: Topic guide for employers (AI firms, non-AI firms and public sector)	40
Appendix C: Topic guide for Employees	46
Appendix D: Topic guide for Aspiring Employees	49
Appendix E: Topic guide for Recruiters	52
Appendix F: Topic guide for Universities & Training Course Providers	56
Appendix G: Inclusion/exclusion criteria for job vacancies analysis	60

1 Overview

The UK Government Department for Digital, Culture, Media & Sport (DCMS) commissioned Ipsos MORI, in association with Perspective Economics, the Alan Turing Institute, and the Queen's University Belfast, to conduct research to improve their understanding of the current UK Artificial Intelligence (AI) market.

The research aimed to gather evidence on:

- Current skills gaps (i.e. where existing employees or job applicants for AI roles lack particular skills that employers require);
- The role of training, recruitment and outsourcing to fill skills gaps;
- Current skills shortages and the level and type of job roles they affect (i.e. a shortfall in the number of skilled individuals working in or applying for AI roles);
- Where the AI jobs market is active geographically;
- The roles being labelled as AI versus ones that are not but require a similar skillset; and
- Diversity within the workforce.

The research also aimed to create a set of recommendations on policy areas that government and industry should focus on to bridge the skills gap.

1.1 Summary of methodology

The methodology consisted of five strands:

Strand 1: Scoping stage. The purpose of this stage was to define and categorise AI skills and job roles, define the sample for the primary research, and gather initial evidence on the current AI skills landscape, higher education and training provision, and pathways into AI jobs. It comprised:

- A Rapid Evidence Review of policy papers, research reports and blogs;
- Ten stakeholder interviews with experts from industry, government, and relevant umbrella bodies;
- Development of an AI taxonomy to build a sample of AI-led and AI-enabled firms to survey;
- An initial analysis of AI job vacancies covering job titles, skills referenced in job descriptions and job postings by sector.

Strand 2: Quantitative survey. This comprised a telephone survey of 118 AI firms, including firms whose core business was developing AI-led products or services, and others in wider sectors developing or using AI tools, technologies or techniques to improve their products, services or internal processes. Fieldwork took place between 25 August and 16 October 2020. A live pilot was also conducted between 18 and 19 August 2020 to test the process and questions; pilot interviews have been included in the findings.

Strand 3: Qualitative interviews. This comprised in-depth interviews with 50 firms, public sector organisations, recruitment agencies, employees and aspiring employees, and course providers, including universities. Interviews took place between December and February 2021.

Strand 4: Job vacancy analysis. This strand analysed online job postings in the UK. The approach involved two search strategies using the Burning Glass Technologies Labour Insight tool. The first search strategy focused on job postings that had been categorised against a range of Burning Glass skill clusters. The second search strategy was more extensive and included a range of keywords for inclusion and exclusion across skills, job titles, and descriptions. This second search yielded the 110,494 job postings used for analysis purposes.

Strand 5: Stakeholder roundtable discussion. Ipsos MORI ran a workshop with key stakeholders from government, industry and academia to discuss the findings from the preceding strands and contribute to the recommendations. This took place in March 2021.

2 Scoping research

2.1 Rapid evidence review

Professor Rob Procter from Warwick University and Professor Roger Woods from Queen's University Belfast led this initial strand of the research in March and April 2020. It aimed to pull together the most important existing evidence on the AI skills gap, with a particular focus on the following objectives:

- Setting out the context of the demand for AI skills within the UK;
- Exploring the range of AI skills that are considered essential for the successful exploitation of AI in the UK and how these may evolve;
- Examining the current state of AI skills supply in the UK, in the context of predicted levels of demand and specific skill gaps identified;
- The state of the current UK cyber skills labour market and common recruitment practices;
- Identify the range of strategies that have been developed by the Government and industry to increase the AI workforce;
- Implications for the quantitative survey, in terms of evidence gaps and relevant question areas.

The methodology for this literature review was as follows. The researchers were given a number of reports that were considered useful by DCMS and Ipsos MORI. Various searches were then undertaken using terms such as 'AI skills', 'AI labour market' and 'AI skills shortage' with a remit of the last 5 years. This produced a range of documents and some were consulted to identify any other useful but unidentified sources. To this have been added sources from the technical literature on AI methods, project management, etc. This produced a long list of 104 sources largely drawn from industry reports.

Preferred texts were identified by DCMS and the researchers read these texts, as well as all others identified on the long list of 104 documents. Each document was evaluated for its relevance, quality and recency of data. For example, documents whose focus was on job losses through AI were discarded, as were reports that were based largely upon the research of other reports. Many reports had a global or US focus. However, the overwhelming evidence from the 47 sources included in this review showed little to dispute that there is a major AI skills gap developing in the UK.

Following this stage, Professor Procter and Professor Wood drafted an internal literature review report for DCMS and Ipsos MORI. This included a list of recommendations for the quantitative survey, in terms of audiences to include and key question areas. This then fed into Ipsos MORI's development of the survey.

2.2 AI Taxonomy to build sample for the quantitative survey

Our main aim was to create a representative overview of firms seeking AI skills in the UK. The use of AI in firms varies widely but it was possible to categorise them into three broad groups:

- Firms in the AI sector, whose core business was designing AI-led products or services;
- Organisations in wider sectors (e.g. fintech) using AI to enhance their products and offers;
- Organisations in wider sectors using AI to improve their internal processes.

The following sources were used to gather an evidence base of AI activity within the UK (with particular reference to understanding commercial activity and being able to link this to labour market activity for this project).

- Beauhurst (to understand where businesses have raised investment, achieved high-growth, or attended an accelerator in relation to the use of AI in product or service development)
- Crunchbase (as above);
- BvD FAME and Companies House (to identify business size, scale and performance);
- Tech Nation (Applied AI cohort) (to identify businesses engaged with the Tech Nation cohort)
- Tussell (to identify businesses that have been awarded public contracts in relation to the use of AI technologies);
- Innovate UK Funded Projects (to identify businesses that have collaborated with universities, or received funding for the development of AI based products or services);
- UKRI Gateway to Research (as above);
- Burning Glass (to identify businesses actively recruiting for AI and Data Science roles).

Using the above sources, Perspective Economics undertook the following process to yield a long-list of firms for further exploration.

- **Data Cleaning:** Many of the sources e.g. Crunchbase did not provide a Registered Number for the firms set out, so the relevant text was cleaned, and Perspective Economics sought to identify the appropriate registered match (through BvD FAME and fuzzy matching company names and registered names at a high threshold);
- **Merged:** All of the firms identified were merged into one long-list.
- **Source Quality:** Where a firm was identified in multiple sources, it was scored to decide whether or not it should be included for short-listing and sample design. Further, within the analysis of Burning Glass data, we identified c. 5,188 organisations recruiting for AI talent; however, the research team subsequently sought to deduplicate employers and / or remove recruiters. Therefore, only employers with five or more job postings with respect to AI were included.
- **Scoring:** The firms in scope were checked against the number of sources used – and were scored to inform likely AI activity (e.g. developing AI based products, recruiting, raising investment etc). This score was used by Ipsos MORI to inform potential relevance to the study with respect to knowledge of and demand for AI skills in their business. This approach meant that companies that were sourced from multiple datasets e.g. Babylon, Darktrace, would score very highly.

3,287 companies were identified (UK registered, active) as in scope for the short-list for the survey. However, following cleaning and a telephone number look-up we loaded into the computer assisted telephone system a sample of 2,371 firms.

It should be noted that our sample frame was focused on those firms who had advertised online for AI roles, it would therefore have limited coverage of firms that do not advertise AI roles online, advertise anonymously through recruitment agencies, or employs analysts who gained skills through their employment (i.e. were not originally recruited into an AI role but moved/developed into these roles internally). It was impossible to sample these firms systematically as they do not appear on job vacancy databases (likely to be small, non-core AI firms).

2.3 Industry expert interviews

Ipsos MORI carried out in-depth telephone interviews with 8 industry experts between April and May 2020. The purpose of this stage of the research was to get expert opinions, beyond the existing literature, on:

- The definition and categorisation of AI skills – how the experts define AI skills, types of technical and soft skills required, differences in skills between job roles, availability of existing categorisations etc;

- Pathways into a career in AI – focusing on typical routes into a career in AI, including qualifications/courses required by employers, whether there is scope for people to transition from another role into AI, the use of apprenticeships and what they thought would be the pathways in the future;
- The current landscape in terms of current skills gaps.

The experts came from a mix of business representative organisations, businesses working with AI, academics working in the field of AI and Government bodies. We sourced participants from existing DCMS contacts/stakeholders.

Interviews lasted c.45 minutes. We recorded each interview and wrote detailed notes for each one with the key discussion points and themes highlighted. We discussed these findings verbally with the DCMS project team, and also provided a written summary as an annex to the literature review report. This then fed into the quantitative survey development. We also asked participants from this stage to review a draft of the questionnaire and comment on it, to feed into the final version.

3 Quantitative Survey

3.1 Survey and questionnaire development

Ipsos MORI developed the questionnaire and all the other survey instruments (such as interviewer instructions, an advance email and a reassurance email for respondents), building in key themes from the existing literature and industry expert interviews. Development took place over two stages, and DCMS approved the questionnaire at each stage:

- academic and stakeholder feedback on the questionnaire – Professor Procter and Professor Woods, along with a number of stakeholders were provided with the questionnaire for comment.
- a pilot survey, consisting of 7 interviews.

Pilot survey

We carried out a short live pilot survey to:

- Time the questionnaire;
- Gather further feedback on the survey introductory text, reassurance email and the questionnaire;
- Test the usefulness of the written interviewer instructions;
- Examine the quality of the sample.

Fieldwork took place between the 18th and 19th August 2020 and 7 pilot interviews were conducted. The pilot sample was taken from the same sample frames used for the main stage survey (see Section 3.2). Ipsos MORI had expected to conduct a larger pilot, however fieldwork was conducted during the pandemic and many firms, particularly large firms were extremely difficult to contact. To build on the pilot the research team at Ipsos MORI listened to interviews at the start of the mainstage to enable any further issues to be identified.

The main questionnaire changes made following the pilot survey were:

- Modifications to the introduction to remove mentions of AI (receptionists did not always recognise that);
- We allowed estimates and included additional definitions for workforce questions;
- Two questions were removed to reduce the overall questionnaire length for the main stage.

Appendix B includes a copy of the final questionnaire used in the main survey.

3.2 Fieldwork

Main stage fieldwork was carried out from 25th August to the 16th October 2020 using a Computer-Assisted Telephone Interviewing (CATI) script.

In total, we completed 118 interviews, comprising 61 firms whose core business was AI, 47 who develop AI internally but whose core business is not AI and 6 firms who use AI internally but do not develop it themselves, 4 firms did not affiliate themselves with one of these groups.

The pandemic impacted on fieldwork, contacting firms was much harder than normal, particularly large firms where employees were working from home. In this situation, many receptionists were unwilling to put interviewers through to home telephone numbers.

Overall 48 interviews were conducted with micro firms (1-9 employees), 57 with small firms (10-49 employees) and 11 with larger firms (50+ employees).

It should be noted that the quantitative data cannot be considered representative of the whole UK AI industry, the data is primarily from SME firms due to the difficulties of getting through to the correct person within large organisations.

Emails were sent to all sample members informing them of the survey and requesting alternative contact details.

Fieldwork preparation

Prior to fieldwork, the Ipsos MORI research team briefed the telephone interviewers. The interviewers also received:

- written instructions about all aspects of the survey
- a copy of the questionnaire and other survey instruments

Screening of respondents

Interviewers used a screener section at the beginning of the questionnaire to identify the right individual to take part and ensure the business was eligible for the survey. At this point, the following organisations would have been removed as ineligible:

- organisations who had not either used AI models, tools, technologies that either their own organisation had developed or had been developed by another organisation
- organisations that identified themselves as sole traders with no other employees on the payroll¹.

When an interviewer established that the organisation was eligible, we asked them to identify the senior member of staff who had the most knowledge or responsibility when it came to data science methods. Interviewers suggested to the gatekeeper that this could be the head of the team or department that covers data science, analytics, business intelligence, data engineering, systems engineering or advanced statistical analysis. Within large organisations interviewers spoke to a senior person who oversees training and recruitment within the organisation, once in contact with this person, the interviewer established who the most appropriate person was to interview.

Random-probability approach and maximising participation

We adopted random-probability sampling to minimise selection bias. The overall aim with this approach was to have a known outcome for every piece of sample loaded. For this survey, we used an approach comparable to other robust business surveys – including the DCMS/Ipsos MORI Cyber Security Surveys – around this:

- We called each piece of sample either a minimum of 7 times, or until we achieved an interview, received a refusal, or received enough information to make a judgment on the eligibility of that contact. Typically, we actually called leads 10 or more times (e.g. when respondents had requested to be called back at an early stage in fieldwork but had subsequently not been reached).
- Each piece of sample was called at different times of the day, throughout the working week, to make every possible attempt to achieve an interview. We also offered evening and weekend interviews on request to respondents.

¹ These are typically excluded for business surveys of this nature as many of the questions asked would not be applicable or relevant to them.

Several steps were taken to maximise participation in the survey and reduce non-response bias. Interviewers pointed respondents to the GOV.UK website to confirm the legitimacy of the study, and provide more information. We also offered to share with them an infographic summary of the findings to thank them for taking part in the survey.

Additional steps taken in light of COVID-19 restrictions

In anticipation of the impact of COVID-19 on participation in the survey, we also took a number of extra steps this year to improve the sample coverage and the response rate, including:

- Manual sample improvement, where members of the research team looked up relevant employee names and job titles, email addresses and alternative phone numbers on Google, LinkedIn and company websites
- Additional matching to existing board-level contacts and email addresses on the DBS Data
- Hosting a freephone telephone number and project-specific email inbox that allowed respondents to reply and set up their own appointments, or take part in the survey there and then

With the collected email addresses, the research team sent out a mass mailing to encourage respondents to reply and set up an appointment, or to correct the contact information we had in the sample for their organisation.

Fieldwork monitoring

Ipsos MORI is a member of the interviewer Quality Control Scheme recognised by the Market Research Society. In accordance with this scheme, the field supervisor on this project listened into at least 10 per cent of the interviews and checked the data entry on screen for these interviews.

3.3 Fieldwork outcomes and response rate

With this survey it is especially important to bear in mind that fieldwork was undertaken during the 2020 pandemic, this made it challenging to reach participants, as some firms were completely closed whilst in other firms receptionists were reluctant to forward calls to employees homes, both of these factors affected the final response rate.

The Ipsos MORI research team monitored fieldwork outcomes and response rates throughout fieldwork and gave interviewers regular guidance on how to avoid common reasons for refusal. Table 1 shows the final outcomes and the adjusted response rate calculation.²

The lower than expected response rates were likely to be due to a combination of unique circumstances brought about by the COVID-19 restrictions, as well as the ongoing challenge of declining response rates in survey fieldwork in general. This survey's fieldwork took place between August and October 2020 and while some restrictions had been lifted, there were still a number of COVID-19 restrictions affecting the business population in place. These restrictions and the overall environment under which fieldwork took place meant:

- It was harder to reach organisations via landline numbers as many switchboards were no longer running or had a skeleton service

² The adjusted response rate with estimated eligibility has been calculated as: completed interviews / (completed interviews + incomplete interviews + refusals + any working numbers expected to be eligible). It adjusts for the ineligible proportion of the total sample used. Expected eligibility has been calculated as: (completed interviews + incomplete interviews + refusals) / (completed interviews + incomplete interviews + refusals + ineligible leads + unusable leads with working numbers).

- When we did get through, it was harder to reach the right individual within the organisation, who may have been working remotely rather than in an office, or may have been placed on furlough
- Where we did reach the right person, these individuals were often busier than before and less willing to take part in surveys in general

Table 1: Fieldwork outcomes and response rate calculations

Outcome	Total
Total sample loaded	2,371
Ineligible (screened out)	61
Unusable numbers³	1,230
Unusable leads with working numbers⁴	413
Sample available for fieldwork	667
Completed interviews	118
Incomplete interviews	8
Refusals	479
Live sample	62
Eligibility (complete + incomplete / (complete + incomplete + ineligible))	67%
Valid sample (fieldwork sample x eligibility)	449
Unadjusted response rate (complete / sample)	5%
Adjusted response rate (complete / valid sample)	26%

Expected negligible impact of lower response rates

It is important to remember that response rates are not a direct measure of non-response bias in a survey, but only a measure of the potential for non-response bias to exist. Previous research into response rates, mainly with consumer surveys, has indicated that they are often poorly correlated with non-response bias.⁵

The idea of non-response bias entering the survey assumes that the organisations declining to take part are substantially different in terms of their AI skills needs to the ones we did interview. If we believe, reasonably, that the response rates were mainly lower due to COVID-19 and associated restrictions, then we must consider whether the businesses most negatively impacted by COVID-19 are likely to have different AI skills needs and challenges – we have no strong reasons to believe this.

³ This is sample where the number was in a valid format, so was loaded into the main survey, but which turned out to be wrong numbers, fax numbers, household numbers or disconnected.

⁴ This includes numbers called 10 or more times over fieldwork without ever being picked up.

⁵ See, for example, Groves and Peytcheva (2008) "The Impact of Nonresponse Rates on Nonresponse Bias: A Meta-Analysis", Public Opinion Quarterly (available at: <https://academic.oup.com/poq/article-abstract/72/2/167/1920564>) and Sturgis, Williams, Brunton-Smith and Moore (2016) "Fieldwork Effort, Response Rate, and the Distribution of Survey Outcomes: A Multilevel Meta-analysis", Public Opinion Quarterly (available at: <https://academic.oup.com/poq/issue/81/2>).

3.4 Data processing and weighting

Coding

The verbatim responses to unprompted questions could be coded as “other” by interviewers when they did not appear to fit into the predefined code frame. Ipsos MORI’s coding team coded these “other” responses manually, and where possible, assigned them to codes in the existing code frame. It was also possible for new codes to be added where enough respondents – 10 per cent or more – had given a similar answer outside of the existing code frame. The accuracy of the coding was verified by the Ipsos MORI research team, who checked and approved each new code proposed.

Weighting

Given the sample size and the lack of reliable data on the profile firms who use AI, that data was not weighted.

3.5 Workforce-level estimates within the surveyed firms only

The following figures in the report are workforce-level estimates within the surveyed firms rather than employer-level estimates. That is, they show findings as a proportion of the AI workforce among the firms surveyed, rather than as a proportion of employers:

- Diversity: proportion of AI employees in the surveyed firms who were female (page 24 in the main report)
- Diversity: proportion of AI employees in the surveyed firms who were from an ethnic minority (page 24 in the main report)
- Diversity: proportion of AI employees within the surveyed firms who were non-UK nationals (page 24 in the main report)

These figures should be treated with caution, and not applied to the whole AI sector as a workforce estimate.

3.6 Rounding of percentages from the survey estimates

In the findings report, the survey data are rounded up to whole percentages. Therefore, in some cases, charts will appear to add to slightly more than 100%. For example, if the calculated estimates for a question are 20.6%, 40.7% and 38.7%, they will show as 21%, 41% and 39%.

4 Qualitative research

Following the survey, Ipsos MORI conducted 50 in-depth, qualitative interviews with individuals from several groups related to the research.

Interviews took place between November 2020 and February 2021: all interviews with businesses were completed in November 2020, with individuals from other groups being interviewed after this.

4.1 Overall breakdown of interviews

The number of interviewees in each group is given in the table below.

Table 2: Number of interviewees by type

Participant types	Number interviewed
AI businesses	10
Non-AI businesses	10
Public-sector employers	4
AI professionals/employees	10
Students aspiring to a career in AI	6
Recruiters	6
Course providers: universities	2
Course providers: other	2
Total	50

The breakdown of interviews across these groups, and our sampling approach for each, was set out in a research plan produced by Ipsos MORI in April 2020 and signed off by DCMS in June 2020. Since then, two changes were made to the sample breakdown:

- This plan originally proposed 8 interviews with public-sector employers and a total of 12 interviews across AI professionals and students. Some of the interviews with public-sector employers were reallocated to these latter groups, because public-sector employers were considered to have a greater range of other opportunities to communicate their views to Government.
- The category of “students” was originally termed “Aspiring AI professionals” and intended to capture a wider range of people who might be seeking a career in AI. However, the range of recruitment approaches we were able to use for this group was limited, resulting in all 6 of them being students. We therefore re-named this group in reporting, to give it a more precise description.

4.2 Sample quotas

The sample was not intended to be representative of businesses using AI or of individuals working in AI. However, we set quotas within the samples of businesses and individuals to ensure that these samples would reflect a range of different experiences and views.

Table 3: Breakdown of sample: businesses

Characteristic	Quota set	Number achieved
AI firms	10 exactly	10
Non-AI firms	10 exactly	10
Micro	Mix and monitor	11
Small		5
Medium		3
Large	5 maximum	1
London	8 maximum	6
South East	8 maximum	2
UK outside London or South East	8 minimum	12
Have hard-to-fill vacancies	12 minimum	13
Do not have hard-to-fill vacancies	3 minimum	7
Experience skills gaps	12 minimum	12
Do not experience skills gaps	2 minimum	4
Experience skills shortages	10 minimum	12
Do not experience skills shortages	2 minimum	2
Experiencing increasing demand	5 minimum	13
Not experiencing increasing demand		7

We also recruited to achieve a mixture of businesses in terms of: perceived reasons why vacancies were hard to fill; views of senior management; and recruitment methods used.

The quotas for individuals were applied across the combined categories of AI professionals and students, unless stated otherwise in table 4.

Table 4: Breakdown of sample: individuals

Characteristic		Quota	Number achieved
Length of time working in AI (professionals only)	Less than 2 years	Min 2	4
	Between 2 and 5 years	Min 2	3
	More than 5 years	Min 2	3
Experience of a different career/industry (professionals only)	Always worked in AI	Max 5	2
	Worked in closely related fields	Min 2	5
	Worked in unrelated fields	Min 2	3
Current status (students only)	Working in field closely related to AI	Min 2	0
	Working in an unrelated field or industry	Otherwise mix and monitor	0
	Student		5
	Unemployed and seeking work		0
	Something else		1
Highest level of qualification	GCSE/O-Level/CSE	Min 1 with less than a Bachelor's Degree. Otherwise mix and monitor	0
	Vocational qualifications (NVQ1+2)		0
	A-Level or equivalent (NVQ3, T-Levels)		3
	Bachelor's Degree or equivalent (NVQ4)		3
	Masters		6
	PhD or equivalent		3
	Other		0
	No formal qualifications		0
Gender	Female	Min 6	6
	Male		10
	Identifying in another way		0
Ethnicity	White	Max 8	9
	Mixed		0
	Asian	Min 1	5
	Black	Min 1	0
	Other		2

The research team also set the following quotas for other groups:

- **Public-sector employers:** at least one local authority and at least one NHS organisation
- **Recruiters:** 3 specialist tech recruiters and 3 non-specialist recruiters

4.3 Recruitment approach

Recruitment was conducted by our specialist recruiter. Businesses were recruited from a recontact sample built up during survey fieldwork. Other groups were identified and approached by the research team in a variety of ways described below, and following initial agreement to participate, went through a screening process conducted by the recruiter.

We offered a £50 payment or charity donation to each participant to encourage participation, with the exception of individuals representing public-sector employers and universities, who were offered a £50 charity donation only.

Recruitment approach: public-sector employers

The research team undertook desk research to identify public-sector organisations that were using AI and data science in their work. DCMS then approached these identified organisations and invited them to take part in the research. While only a minority of those approached by DCMS ultimately took part in the research, this meant that for this group only, we could not assure participants of the same level of anonymity as other groups taking part. We informed all public-sector organisations taking part that there was a small chance that DCMS would be able to identify them based on the research findings, even though we would exclude any names of organisations or individuals in the reporting. All public-sector organisations we spoke to were happy to take part on this basis.

Recruitment approach: AI professionals/employees

During the employer interviews we asked employers if they would be willing to invite any of their staff to take part in the research. Some employers agreed, and contacted particular employees of their choosing and asked for the employee's consent to share their contact details with us. We recruited 4 AI professionals in this way.

The remaining 6 AI professionals were recruited by posting in LinkedIn groups related to data science and AI in the UK; and through the research team's professional networks. Originally, we had hoped to recruit more of this group through attending events such as conferences and Meetup groups, but unfortunately this approach was not possible due to the COVID-19 pandemic.

Recruitment approach: students seeking a career in AI

Originally, we had hoped to recruit this group through attending events such as conferences and Meetup groups, but unfortunately this approach was not possible due to the COVID-19 pandemic. Instead, the research team posted on relevant LinkedIn groups, and approached AI and data science student societies and asked them to promote the research among their members.

Recruitment approach: recruiters

The research team identified recruitment consultants recruiting professionals for AI roles through searches on online job boards for roles containing key terms. Individual recruiters were then contacted by email and invited to participate.

Recruitment approach: course providers

The research team identified course providers through desk research, recommendations from AI professionals we interviewed, and recommendations from the initial stakeholder interviews conducted at the outset of the project. Relevant individuals were then contacted by email and invited to participate.

4.4 Fieldwork

Each interview was carried out by telephone or over Microsoft Teams by one of the Ipsos MORI core research team and lasted c.45-60 minutes.

The topics for discussion were compiled collaboratively between Ipsos MORI and DCMS. The starting-point for this was the list of research questions provided by DCMS at the outset of the project; the research plan identified which of these questions could be addressed by qualitative research, and which would be primarily answered by the qualitative element of the project and should therefore be a priority for this element. The list of topics was then developed further following the rapid evidence review, which identified evidence gaps that could be explored through qualitative research. Further to this, Ipsos MORI

and DCMS also discussed the research topics that would better suit a qualitative approach during the development of the quantitative questionnaire.

The research team created discussion guides for each of the following groups: employers, professionals, students, recruiters and course providers. While each of these followed a somewhat different structure, they all covered topics relating to: the supply and demand of AI skills; employer needs; recruitment approaches; qualifications and training; diversity; and the role of Government and industry in addressing labour market challenges.

4.5 Analysis

Interviews from each group were summarised in a grid which set out the data each interview had provided against each of the interview topics and research questions.

Throughout fieldwork, the core research team held three analysis sessions at which we discussed interim findings and outlined areas to focus on in subsequent interviews. At the end of fieldwork, we drew out key themes and case studies to include in the final findings.

4.6 Interpreting qualitative findings

Qualitative research approaches are used to shed light on why people hold particular views, or have particular experiences, rather than how many people have those views or experiences. These approaches are used to explore the nuances and diversity of experiences and the factors which shape or underlie them. The results are intended to be illustrative and explanatory, rather than statistically reliable.

It is not always possible in qualitative research to provide a precise or useful indication of the prevalence of a certain outcome or experience, due to the relatively small number of participants generally involved and because the sample is not intended to be statistically representative of the wider population.

Sometimes, ideas can be mentioned a number of times in a discussion, and yet hide the true drivers of experience; or a minority view can, in analysis, turn out to express an important emergent view or trend. The value of qualitative work is to identify the issues which bear future investigation. In reporting the qualitative findings, we focus on exploring the breadth of experiences, and identifying the main themes, rather than the number of people who have expressed that thought. Any proportions used in qualitative reporting, such as “some” or “many”, should always be considered indicative, rather than exact.

5 Job vacancies analysis

In order to identify job postings requesting AI and Data Science (or similar) skills, two search strategies were undertaken using the Burning Glass Technologies Labour Insight tool.

These job postings were limited to the UK, and the postings analysed typically reflected those posted in 2020 (1st January – 31st December).

The first search strategy focused on an initial search for job postings that had been categorised against a range of Burning Glass skill clusters. The second search strategy was more refined, and sought to include a range of keywords for inclusion and exclusion across skills, job titles, and descriptions.

This second search yielded the 110,494 job postings used for analysis purposes.

5.1 Search approach

Search Strategy: Initial

UK-wide AND (Cluster : Analysis: Machine Learning OR Cluster : Information Technology: Artificial Intelligence OR Cluster : Analysis: Data Mining OR Cluster : Analysis: Data Science OR Cluster : Analysis: Data Analysis OR Cluster : Analysis: Natural Language Processing (NLP) OR Cluster : Analysis: Statistics OR Analysis: Statistical Software)

This search identified 158,012 job postings in 2020. Table 5 and Table 6 set out the number of job postings that mentioned the respective skills or job titles. The job titles were subject to review, and used to inform inclusion and exclusion criteria set out in Search Strategy 2.

Table 5: Number of job postings by skills cluster

Skill Cluster	Skill Cluster Postings
ANALYSIS: Data Analysis	87,134
INFORMATION TECHNOLOGY: SQL Databases and Programming	37,038
INFORMATION TECHNOLOGY: Scripting Languages	36,823
ANALYSIS: Machine Learning	36,276
ANALYSIS: Data Science	33,741
BUSINESS: Project Management	28,101
INFORMATION TECHNOLOGY: Software Development Principles	26,627
INFORMATION TECHNOLOGY: Microsoft Office and Productivity Tools	21,392
BUSINESS: Business Process and Analysis	21,100
ANALYSIS: Statistical Software	18,668
INFORMATION TECHNOLOGY: Artificial Intelligence	17,746
INFORMATION TECHNOLOGY: Data Management	16,229
INFORMATION TECHNOLOGY: Database Administration	15,810
ANALYSIS: Statistics	15,366
INFORMATION TECHNOLOGY: Big Data	15,024

Table 6: Number of job postings by Job title

BGTOCC	Job Postings
Data / Data Mining Analyst	18,043
Software Developer / Engineer	15,267
Data Scientist	7,048
Researcher / Research Associate	3,734
Computer Systems Engineer / Architect	3,686
Business / Management Analyst	3,610
Data Engineer	3,457
Computer Programmer	2,642
Financial Analyst	2,629
Marketing Manager	2,348
Systems Analyst	2,224
Project Manager	2,220
Office / Administrative Assistant	2,170
Financial Manager	2,003
Medical Scientist	1,856
Database Administrator	1,775
Data Warehousing Specialist	1,767
Web Developer	1,646
IT Project Manager	1,642
Operations Analyst	1,519
Market Research Analyst	1,507
Account Manager / Representative	1,438
University Lecturer	1,349
Human Resources / Labour Relations Specialist	1,335
Sales Manager	1,215

Roles highlighted in red were subsequently removed.

Search Strategy 2: Refined – Used within the research chapter

Following the rapid evidence review, and review of the first search strategy, the research team subsequently used the search strategy set out in Appendix G to identify roles in scope. This is informed by several keywords (whereby the job title, description, or skills refer to any or all of the keywords), and Boolean logic regarding job titles to be included or excluded (in addition to any roles using the key words). The benefit of this process was that it helped to remove roles that were considered to be not well aligned to the research e.g. office administration, recruitment consultants, sales executives etc. It also should better capture roles where AI or Data Science skills were explicitly mentioned. For example, not all Data Analyst or Software Engineer job postings may request such skills within the job posting text.

This process identified 110,494 job postings in 2020, and is used to inform analysis of each of the core metrics in the Job Vacancies chapter.

5.2 Metrics analysed

The analysis took advantage of the following data outputs from the Burning Glass Technologies database:

- The number of relevant job postings requesting AI and data science skills in the UK, including a time-series analysis of the number of job postings posted each month over the last year
- The industry sectors of the employers seeking people in AI and data roles
- The geographic locations across the UK for these job postings
- Advertised job titles (to analyse the job roles most in demand)
- Job descriptions (to analyse the skills, experience, education, and qualifications being requested)
- The salaries or salary ranges being offered in these job postings

The analysis of the overall number of job postings also considers the changes in the market over the course of the COVID-19 pandemic.

5.3 Strengths and limitations of this approach

This methodology added a great deal of insight to the quantitative survey data, particularly around the geographical clustering of job postings. It also reinforced the survey findings in many areas, adding another layer of credibility to this data.

A summary of the advantages of this approach is as follows:

- **Volume and granularity** – we were able to analyse hundreds of thousands of job postings since 2014 (but focusing on the labour market in 2020), exploring the specific jobs, skills, and qualifications in demand. It can also drill down into areas such as the specific coding languages being sought. This method can uncover geographic clustering (down to specific towns and cities) of high demand and skills shortages for AI and data science professionals.
- **Real-time analysis** – the highly up-to-date data on Burning Glass Technologies can provide insight into the labour market at that given moment in time. By contrast, survey statistics and other secondary data are typically several months or years old, and they are not regularly updated. This is especially important given the fast-moving nature of AI and data roles and the evolving demand for skills.
- **Strong coverage** – the Burning Glass Technologies platform scrapes more than 40,000 online data sources⁶. Online postings reflect an estimated 85 per cent of jobs posted in the labour market (versus, e.g. print media).

However, the findings are based solely on job postings recorded on the Burning Glass Technologies platform. This means that the data comes with the following limitations:

- **Selection bias** – Burning Glass Technologies only scrapes free-to-use jobsites, which potentially leaves an (unknown) risk of bias if major employers are using closed platforms to post jobs, or other ways of recruiting such as networking and word-of-mouth. However, we believe this is offset by both the high volume and high coverage of the data that is available. This data still gives a strong insight into the trends and patterns in the labour market

⁶ See <https://www.burning-glass.com/about/faq/>.

- **Interpretation of job roles** – the Burning Glass Technologies interpretation of AI roles jobs is reliant upon our working definition, search strategy, and is based on the skills, job titles and qualifications expected for AI and data science roles. We note that our search strategy is deliberately broad to capture junior and senior demand for such roles. There is a risk that some roles within their interpretation may not truly be considered an AI or Data Science role (e.g. a role in which knowledge of AI techniques might be desirable, but not necessarily used in reality e.g. an entry level Data Analyst that uses SQL). This is the most substantial risk associated with this methodology and is why we use a bespoke search strategy, with the tailored inclusion/exclusion terms, and include this within the report for transparency.

In the findings report, we typically show the percentages from the job vacancies analysis to 1 decimal place. This is because, unlike the survey estimates, they are based on the entirety of the secondary dataset, rather than a survey sample – they are, therefore, not estimates with margins of error.

Further, some of the metrics covered by the Burning Glass dataset will have varying sample sizes. For example, whilst all roles will have a job title, there are other measures that can be less complete such as salary brackets or employer (where the advertisement is through a recruiter). Where the sample size is lower than the number of job postings, we set out the size of the underlying sample for each measure accordingly.

6 Recommendations workshop

Ipsos MORI hosted a virtual workshop on Teams in March 2021. The organisations represented at the workshop were DCMS, BEIS, stakeholders from the Alan Turing Institute, Tech UK, University of Southampton, Cambridge Spark, Microsoft, the Ministry of Defence and the UK Space Agency. Ipsos MORI's study partners also attended, namely Sam Donaldson from Perspective Economics, Professor Rob Procter from Warwick University and Professor Roger Woods from Queen's University Belfast.

The purpose of the workshop was to help co-create a set of recommended policy areas to take forward from the study.

Workshop participants first received a presentation of the key findings from the primary and secondary research. Ipsos MORI then facilitated a series of breakout discussion groups on the main research topics: skills gaps, recruitment and vacancies, pathways into working in AI, workforce diversity and training. All participants received a summary of the results before the workshop.

Ipsos MORI used the notes from these breakout discussions to inform this year's draft recommendations, which were all based on evidence generated from the primary and secondary research strands. The DCMS project team approved the final set of recommendations.

7 Acknowledgements

Ipsos MORI would like to thank the following partners who contributed at various stages to the study:

- Sam Donaldson, Perspective Economics
- Professor Rob Procter from Warwick University
- Professor Roger Woods from Queen's University Belfast.

Appendix A: questionnaire

20-016796-01 AI Skills Questionnaire V4

Note: We have budgeted for a 15m questionnaire, which will allow space for c.20 to 30 questions.

KEY

ALL ROUTING/SCRIPTING INSTRUCTIONS IN CAPS AND GREY
QUESTION/DUMMY VARIABLE IN RED

Question wording in bold

[Text substitutions in square brackets]

INTRODUCTION

Hello, my name is ... calling from Ipsos MORI, an independent research organisation. We are conducting a study for the government Department for Digital Culture, Media and Sport.

INTRO

[IF AN AI BUSINESS (S_GROUP=_01) **Please can I speak to a senior person who oversees training and recruitment within your organisation?**]

[IF NOT AN AI BUSINESS (S_GROUP=_02 OR _03) **Please can I speak to someone in your organisation who oversees the use of any data science methods or tools? This could be the head of the team or department that covers any of the following:**

- data science
- analytics
- business intelligence
- data engineering
- systems engineering
- advanced statistical analysis.]

ONCE THROUGH TO RESPONDENT

Hello, my name is ... calling from Ipsos MORI, an independent research organisation. We are conducting a study for the government's Office for Artificial Intelligence and DCMS about organisations' data science skills needs.

Would you be happy to take part in an interview? This should only take around 15 minutes and your answers will be anonymous and only reported at an aggregate level.

REASSURANCES TO USE:

- **The research is to collect government statistics only.**
- **It will help inform the Office for Artificial Intelligence about how it can best help organisations/teams like yours to meet your skills and recruitment needs.**
- **It is endorsed by the Institute of Coding and the Alan Turing Institute.**
- **We can share an infographic summary of the findings with you as a thank you for taking part.**
- **You can verify the research by going to the GOV.UK website, at [LINK](#)**

STANDARD REASSURANCE EMAIL SCREENS

CONSENT

ASK ALL

CONSENT

Before we start, I just want to clarify that participation in the survey is confidential and voluntary. You can change your mind at any time. Are you happy to proceed with the interview?

If you would like to read the privacy policy before we continue, I can give you the link. If you're happy to proceed we'll continue.

ADD IF NECESSARY: You can access the privacy policy on our website at: LINK

1. Yes
2. No (THANK AND CLOSE)

SECTION 1: USE OF AI

ASK ALL

PILOTTITLE

Can I take your job title?

1. ENTER TEXT

READ OUT TO ALL

CATEGOR

These next questions are to help us understand your organisation's use of artificial intelligence, or AI.

ASK IF LISTED ON SAMPLE AS DEVELOPING OR USING AI, BUT NOT AN AI BUSINESS (S_GROUP = _02 or _03)

MULTICODE OK

GROUPCHK

Which of the following has your team done within the last 3 years?

READ OUT

1. Used AI models, tools or technologies that your organisation has developed
- 2.

Use AI models, tools or technologies that another organisation has developed

DUMMY VARIABLE NOT ASKED

CODE 1 IF CORE BUSINESS IS AI ON SAMPLE (S_GROUP = _01)

CODE 2 IF WIDER AI DEVELOPER (GROUPCHK CODE 2)

CODE 3 IF ONLY USING AI (GROUPCHK CODE 3 AND NOT CODE 2)

NEWGROUP

1. Core business is AI
2. Develop AI internally but core business is not AI
3. Use AI internally but do not develop it themselves

ASK ALL

MULTICODE OK EXCEPT CODE 3 AND DK

DISPLAY AS A GRID WITH CODES AS COLUMNS AND STATEMENTS AS ROWS

RANDOMISE ORDER OF STATEMENTS

METHOD

Has your organisation worked with any of the following areas of AI within the last 3 years? And do you plan to do so within the next 3 years?

READ OUT TEXT IN BOLD FIRST. ONLY READ ADDITIONAL DESCRIPTIONS IF NECESSARY AND BEFORE CODING DON'T KNOW.

- a. **Robotics** – training robots to interact with the world in generalisable and predictable ways
 - b. **Computer vision** – gaining high-level understanding from digital images or video
 - c. **Natural Language Processing** – analysing large amounts of speech or text to extract or summarise information
 - d. **Collaborative systems** – autonomous systems that can work collaboratively with other systems, and with humans
 - e. **Bio-inspired computing models** – this includes evolutionary algorithms and algorithmic game theory
 - f. **Bio-inspired hardware** – new forms of AI-enhanced hardware, e.g. using neuromorphic computing techniques
 - g. **Edge intelligence** – combining AI with edge computing, as in the Internet of Things and “smart home” devices
 - h. **Classification** – assigning a class or label to a previously unseen input, e.g. to identify spam emails
 - i. **Predictive machine learning** – estimating the value of a discrete variable based on historic data, e.g. to forecast customer churn
 - j. **Regression for machine learning** – estimating the value of a continuous variable based on historic data, e.g. to forecast house prices
1. Already used in the last 3 years
 2. Plan to use within the next 3 years
 3. Do not plan to use
 4. DO NOT READ OUT: Don't know

ASK ALL

MULTICODE OK EXCEPT CODE 3 AND DK

METHODOTH

Has your organisation worked with any other types of AI process or applications, other than the ones I have just mentioned, in the last 3 years, or do you plan to do so within the next 3 years?”

1. Already used in the last 3 years (SPECIFY)
2. Plan to use within the next 3 years (SPECIFY)
3. Do not plan to use
4. DO NOT READ OUT: Don't know

DUMMY VARIABLE NOT ASKED

CODE 1 IF RESPONDENT VALIDATES AT LEAST ONE FORM OF AI (AT LEAST 1 CODE 1 AT METHODa-h OR METHODOTH)

OTHERWISE CODE 2

METHODCHK

1. Respondent identified at least one form of AI currently used
2. No form of AI identified – to recheck interview immediately with telephone team (THANK AND CLOSE)

ASK ALL
 MULTICODE OK EXCEPT DK
 RANDOMISE LIST EXCEPT CODE 10 AND DK
LEARNING

Does your work with AI use any of the following types of machine learning techniques?

READ OUT

1. Deep learning
2. Bayesian models and networks
3. Neuromorphic computing
4. Clustering
5. Random forests
6. Association rule learning
7. Graph-based methods
8. Support vector machines
9. Spatial data analysis
10. Any other machine learning technique (SPECIFY)
11. DO NOT READ OUT: Don't know
12. DO NOT READ OUT: None of these

SECTION 2: ORGANISATION PROFILE

ASK ALL
 NUMERIC. MIN=1, MAX=99,999.
 SOFT CHECK IF >4,999
FIRMSIZE

**Including yourself, approximately how many employees work for your organisation across the UK?
 Please include both full-time and part-time staff on your payroll, as well as any directors or owners, and any staff on fixed-term contracts.**

PROBE FOR BEST ESTIMATE BEFORE SELECTING DON'T KNOW

1. ENTER NUMBER THEN CODE TO BANDS
2. DO NOT READ OUT: Don't know

ASK IF DON'T KNOW EXACT SIZE (FIRMSIZE DK)
 SINGLE CODE
FIRMSIZEBANDS

Would you say there are...?

PROMPT TO CODE UNTIL YOU REACH THE RIGHT ANSWER

1. 1 to 9
2. 10 to 29
3. 30 to 49
4. 50 to 99
5. 100 to 249
6. 250 to 499
7. 500 to 999
8. 1,000 to 4,999
9. 5,000 or more
10. DO NOT READ OUT: Don't know

ASK IF LISTED ON SAMPLE AS AN AI BUSINESS (S_GROUP = _01)
 NUMERIC. MIN=1, MAX=SMALLER OF EITHER ANSWER AT FIRMSIZE, TOP OF BAND AT FIRMSIZEBANDS
 OR 9,999.

SOFT CHECK IF >999

AISIZEA_1

How many employees specifically use AI models, tools or technologies in their work, i.e. excluding any back-office staff?

Please include both full-time and part-time staff on your payroll, as well as any directors or owners, and any staff on fixed-term contracts.

PROBE FOR BEST ESTIMATE BEFORE SELECTING DON'T KNOW

1. ENTER NUMBER THEN CODE TO BANDS
2. DO NOT READ OUT: Don't know

ASK IF DON'T KNOW AS A NUMBER (AISIZEA_1 DK)

SINGLE CODE

ONLY SHOW CODES UP TO ANSWER AT FIRMSIZEBANDS OR EQUIVALENT ANSWER AT FIRMSIZE

AISIZEA_2

Is it...?

PROMPT TO CODE UNTIL YOU REACH THE RIGHT ANSWER

1. 1 to 9
2. 10 to 29
3. 30 to 49
4. 50 to 99
5. 100 to 249
6. 250 to 499
7. 500 to 999
8. 1,000 to 4,999
9. 5,000 or more
10. DO NOT READ OUT: Don't know

DUMMY VARIABLE NOT ASKED

CODE 1 IF AISIZEA_2 CODES 1 TO 3

CODE 2 IF AISIZEA_2 CODES 4 TO 9

CODE 3 IF AISIZEA_2 DK

DUMAISIZEA

1. AI business with under 50 people in AI roles
2. AI business with 50+ people in AI roles
3. AI business with unknown number of people in AI roles

ASK IF LISTED ON SAMPLE AS DEVELOPING OR USING AI, BUT NOT AN AI BUSINESS (S_GROUP = _02
 OR _03)

NUMERIC. MIN=1, MAX=SMALLER OF EITHER ANSWER AT FIRMSIZE, TOP OF BAND AT FIRMSIZEBANDS
 OR 99.

SOFT CHECK IF >30

AISIZEB

How many of your current employees have made use of AI models, tools or technologies directly in their work in the last 3 years?

INTERVIEWER: DO NOT INCLUDE PREVIOUS EMPLOYEES WHO HAVE SINCE LEFT

1. ENTER NUMBER
2. DO NOT READ OUT: Don't know

ASK IF NOT AN AI BUSINESS AND KNOW HOW MANY EMPLOYEES ARE IN AI ROLES (AISIZEB NOT DK)
 NUMERIC. MIN=AISIZEB, MAX=SMALLER OF EITHER ANSWER AT FIRMSIZE, TOP OF BAND AT
 FIRMSIZEBANDS OR 99.

SOFT CHECK IF >30

TEAMSIZ

And how many employees overall make up the specific team or department that these [AISIZEB] staff members work in?

PROBE FOR BEST ESTIMATE BEFORE SELECTING DON'T KNOW

1. ENTER NUMBER
2. DO NOT READ OUT: No specific team or department
3. DO NOT READ OUT: Don't know

ASK IF HAVE A SPECIFIC TEAM OR DEPARTMENT (TEAMSIZ NOT CODE 2)

ALLOW MULTICODE FOR 1-13 UP TO MAX 3 CODES

TEAM

What is this primary function of this specific team or department?

PROMPT TO CODE

INTERVIEWER: IF MORE THAN ONE TERM FITS, ASK WHICH ONE FITS BEST

1. Specific AI team or department
2. Data science
3. Algorithms and models
4. Analytics
5. Big data
6. Coding or programming
7. Databases
8. Innovation
9. IT
10. Research and development, or R&D
11. Statistical analysis
12. Systems engineering
13. Other (SPECIFY)
14. DO NOT READ OUT: No specific team or department

ASK ALL

OUTSOURCE

Has your organisation ever used external contractors for any work involving AI models, tools or technologies?

1. Yes
2. No
3. DO NOT READ OUT: Don't know

SECTION 3: WORKFORCE PROFILE

READ OUT IF AN AI BUSINESS AND KNOW HOW MANY EMPLOYEES ARE IN AI ROLES (DUMAISIZEA NOT CODE 3)

WORKFORCEPROFILEA

I'd now like to ask you some questions specifically about the [AISIZEA_1 OR AISIZEA_2] employees that work directly on AI-related projects.

READ OUT IF NOT AN AI BUSINESS AND KNOW HOW MANY EMPLOYEES ARE IN AI ROLES (AISIZEB NOT DK)

WORKFORCEPROFILEB

[IF AISIZEB>1 I'd now like to ask you some questions specifically about the [AISIZEB] employees that have used the AI models, tools or technologies in their work.]

[IF AISIZEB=1 I'd now like to ask you some questions specifically about the employee that has used the AI models, tools or technologies in their work.]

ASK IF AI BUSINESS WITH UNDER 50 EMPLOYEES IN AI ROLES OR IF NOT AN AI BUSINESS AND KNOW HOW MANY EMPLOYEES ARE IN AI ROLES (CODE 1 AT DUMAISIZEA OR AISIZEB NOT DK)
 DISPLAY AS A GRID WITH CODES AS COLUMNS AND STATEMENTS AS ROWS
 NUMERIC. FOR EACH STATEMENT, MIN=1, MAX=WHICHEVER ANSWERED OUT OF AISIZEA_1, TOP OF BAND AT AISIZEA_2 OR AISIZEB.
 HARD CHECK IF TOTAL ACROSS STATEMENTS > WHICHEVER ANSWERED OUT OF AISIZEA_1, TOP OF BAND AT AISIZEA_2 OR AISIZEB

PATHWAYNUM

[IF AISIZEB≠1 **How many of these employees entered their current job role in each of the following ways?**]

[IF AISIZEB=1 **Did this employee enter their current job role in any of the following ways?**]

READ OUT

- a. From a previous role where they had used AI before
- b. From a previous role where they had not used AI before
- c. As a career starter (e.g. a graduate position)
- d. As an apprentice
- e. Through an internship

1. ENTER NUMBER
2. DO NOT READ OUT: Don't know

ASK IF AI BUSINESS WITH 50+ EMPLOYEES IN AI ROLES (CODE 2 AT DUMAISIZEA)
 SINGLE CODE
 DISPLAY AS A GRID WITH CODES AS COLUMNS AND STATEMENTS AS ROWS
 SOFT CHECK IF ANY CODES 5-7 (I.E. BETWEEN 50% AND 100% FOR ALL OF THE STATEMENTS)

PATHWAYPER

Roughly what percentage of these employees entered their current job role in each of the following ways?

READ OUT

PROBE UNTIL YOU REACH THE RIGHT ANSWER

- a. From a previous role where they had used AI before
- b. From a previous role where they had not used AI before
- c. As a career starter (e.g. a graduate position)
- d. As an apprentice
- e. Through an internship

1. None of them
2. Under 10%
3. 10% to under 25%
4. 25% to under 50%
5. 50% to under 75%
6. 75% to under 100%
7. All, or virtually all of them (i.e. 100%)
8. DO NOT READ OUT: Don't know

ASK IF AI BUSINESS WITH UNDER 50 EMPLOYEES IN AI ROLES OR IF NOT AN AI BUSINESS AND KNOW HOW MANY EMPLOYEES ARE IN AI ROLES (CODE 1 AT DUMAISIZEA OR AISIZEB NOT DK)
 NUMERIC. MIN=0, MAX=WHICHEVER ANSWERED OUT OF AISIZEA_1, TOP OF BAND AT AISIZEA_2 OR AISIZEB.

FEMALENUM

[IF DUMAISIZEA CODE 1 **Of these [AISIZEA_1 OR AISIZEA_2] employees, how many are female?**]

[IF AISIZEB>1 **Of these [AISIZEB] employees, how many are female?**]

[IF AISIZEB=1 **Is this employee female?**]

ADD IF NECESSARY: Please provide your best estimate. Your answers are confidential and won't be linked to your business. They will help us understand how diverse the sector is.

1. ENTER NUMBER
2. DO NOT READ OUT: Don't know
3. DO NOT READ OUT: Prefer not to say

ASK IF AI BUSINESS WITH 50+ EMPLOYEES IN AI ROLES (CODE 2 AT DUMAISIZEA)

PERCENTAGE. MIN=0, MAX=100.

FEMALEPER

Of these [AISIZEA_1 OR AISIZEA_2] employees, roughly what percentage are female?

ADD IF NECESSARY: Please provide your best estimate. Your answers are confidential and won't be linked to your business. They will help us understand how diverse the sector is.

PROBE FOR BEST ESTIMATE BEFORE CODING DON'T KNOW

1. ENTER PERCENTAGE
2. DO NOT READ OUT: Don't know
3. DO NOT READ OUT: Prefer not to say

ASK IF CAN'T SAY EXACT PERCENTAGE (FEMALEPER DK OR REF)

SINGLE CODE

FEMALEPERB

Is it...?

PROBE UNTIL YOU REACH THE RIGHT ANSWER

1. None of them
2. Under 10%
3. 10% to under 25%
4. 25% to under 50%
5. 50% to under 75%
6. 75% to under 100%
7. All, or virtually all of them (i.e. 100%)
8. DO NOT READ OUT: Don't know
9. DO NOT READ OUT: Prefer not to say

ASK IF AI BUSINESS WITH UNDER 50 EMPLOYEES IN AI ROLES OR IF NOT AN AI BUSINESS AND KNOW HOW MANY EMPLOYEES ARE IN AI ROLES (CODE 1 AT DUMAISIZEA OR AISIZEB NOT DK)
 NUMERIC. MIN=0, MAX=WHICHEVER ANSWERED OUT OF AISIZEA_1, TOP OF BAND AT AISIZEA_2 OR AISIZEB.

BAMENUM

[IF AISIZEB≠1 **How many of these [AISIZEB] employees are from ethnic minority backgrounds?**]

[IF AISIZEB=1 **Is this employee from an ethnic minority background?**]

ADD IF NECESSARY: Please provide your best estimate. Your answers are confidential and won't be linked to your business. They will help us understand how diverse the sector is.

1. ENTER NUMBER
2. DO NOT READ OUT: Don't know
3. DO NOT READ OUT: Prefer not to say

ASK IF AI BUSINESS WITH 50+ EMPLOYEES IN AI ROLES (CODE 2 AT DUMAISIZEA)

PERCENTAGE. MIN=0, MAX=100.

BAMEPER

Roughly what percentage of these [AISIZEA_1 OR AISIZEA_2] employees are from ethnic minority backgrounds?

ADD IF NECESSARY: The answers won't be linked to your business. They will be aggregated across all interviews, to help us measure diversity across the whole AI workforce.

PROBE FOR BEST ESTIMATE BEFORE CODING DON'T KNOW

1. ENTER PERCENTAGE
2. DO NOT READ OUT: Don't know
3. DO NOT READ OUT: Prefer not to say

ASK IF CAN'T SAY EXACT PERCENTAGE (BAMEPER DK OR REF)
SINGLE CODE

BAMEPERB

Is it...?

PROBE UNTIL YOU REACH THE RIGHT ANSWER

1. None of them
2. Under 10%
3. 10% to under 25%
4. 25% to under 50%
5. 50% to under 75%
6. 75% to under 100%
7. All, or virtually all of them (i.e. 100%)
8. DO NOT READ OUT: Don't know
9. DO NOT READ OUT: Prefer not to say

ASK IF AI BUSINESS WITH UNDER 50 EMPLOYEES IN AI ROLES OR IF NOT AN AI BUSINESS AND KNOW HOW MANY EMPLOYEES ARE IN AI ROLES (CODE 1 AT DUMAISIZEA OR AISIZEB NOT DK) NUMERIC. MIN=0, MAX=WHICHEVER ANSWERED OUT OF AISIZEA_1, TOP OF BAND AT AISIZEA_2 OR AISIZEB.

NONUKNUM

[IF AISIZEB≠1 **How many of these [AISIZEB] employees are non-UK nationals?**]

[IF AISIZEB=1 **Is this employee a non-UK national?**]

ADD IF NECESSARY: The answers won't be linked to your business. They will be aggregated across all interviews, to help us measure diversity across the whole AI workforce.

1. ENTER NUMBER
2. DO NOT READ OUT: Don't know
3. DO NOT READ OUT: Prefer not to say

ASK IF AI BUSINESS WITH 50+ EMPLOYEES IN AI ROLES (CODE 2 AT DUMAISIZEA) PERCENTAGE. MIN=0, MAX=100.

NONUKPER

Roughly what percentage of these [AISIZEA_1 OR AISIZEA_2] employees are non-UK nationals?

ADD IF NECESSARY: The answers won't be linked to your business. They will be aggregated across all interviews, to help us measure diversity across the whole AI workforce.

PROBE FOR BEST ESTIMATE BEFORE CODING DON'T KNOW

1. ENTER PERCENTAGE
2. DO NOT READ OUT: Don't know
3. DO NOT READ OUT: Prefer not to say

ASK IF CAN'T SAY EXACT PERCENTAGE (BAMEPER DK OR REF)
SINGLE CODE

NONUKPERB

Is it...?

PROBE UNTIL YOU REACH THE RIGHT ANSWER

1. None of them
2. Under 10%
3. 10% to under 25%
4. 25% to under 50%
5. 50% to under 75%
6. 75% to under 100%
7. All, or virtually all of them (i.e. 100%)
8. DO NOT READ OUT: Don't know
9. DO NOT READ OUT: Prefer not to say

SECTION 4: QUALIFICATIONS

ASK ALL

The next set of questions ask about the [IF AISIZE=1: employee, IF AISIZEB≠1: AISIZEB employees that have used AI models, tools or technologies in their work]

ASK IF AI BUSINESS WITH UNDER 50 EMPLOYEES IN AI ROLES OR IF NOT AN AI BUSINESS AND KNOW HOW MANY EMPLOYEES ARE IN AI ROLES (CODE 1 AT DUMASIZEA OR AISIZEB NOT DK)

DISPLAY AS A GRID WITH CODES AS COLUMNS AND STATEMENTS AS ROWS

NUMERIC. FOR EACH STATEMENT, MIN=0, MAX=WHICHEVER ANSWERED OUT OF AISIZEA_1, TOP OF BAND AT AISIZEA_2 OR AISIZEB.

HARD CHECK IF ANY ONE STATEMENT > WHICHEVER ANSWERED OUT OF AISIZEA_1, TOP OF BAND AT AISIZEA_2 OR AISIZEB

QUALSNUM

[IF AISIZEB≠1 **How many have completed any of the following types of qualifications?**]

[IF AISIZEB=1 **Has this employee completed any of the following types of qualifications?**]

Please tell us about all their qualifications not just their highest qualification.

INTERVIEWER: A MOOC is an online course aimed at unlimited participation and open access via the web

READ OUT

- a. An undergraduate degree
- b. A Master's degree
- c. A PhD
- d. A Massive Open Online Course, or MOOC

1. ENTER NUMBER
2. DO NOT READ OUT: Don't know

ASK IF AI BUSINESS WITH 50+ EMPLOYEES IN AI ROLES (CODE 2 AT DUMASIZEA)

SINGLE CODE

DISPLAY AS A GRID WITH CODES AS COLUMNS AND STATEMENTS AS ROWS

QUALSPER

Roughly what percentage of employees in AI roles have completed any of the following types of qualifications?

READ OUT

PROBE UNTIL YOU REACH THE RIGHT ANSWER

- a. An undergraduate degree
- b. A Master's degree
- c. A PhD
- d. A Massive Open Online Course, or MOOC

1. None of them
2. Under 10%
3. 10% to under 25%
4. 25% to under 50%
5. 50% to under 75%
6. 75% to under 100%
7. All, or virtually all of them (i.e. 100%)
8. DO NOT READ OUT: Don't know

ASK IF AI BUSINESS WITH UNDER 50 EMPLOYEES IN AI ROLES OR IF NOT AN AI BUSINESS AND KNOW HOW MANY EMPLOYEES ARE IN AI ROLES, AND EMPLOYEES HAVE A HIGHER EDUCATION (ANY QUALSNUM_{a-c}>0)

DISPLAY AS A GRID WITH CODES AS COLUMNS AND STATEMENTS AS ROWS

NUMERIC. FOR EACH STATEMENT, MIN=1, MAX=WHICHEVER ANSWERED OUT OF AISIZEA_1, TOP OF BAND AT AISIZEA_2 OR AISIZEB.

HARD CHECK IF ANY ONE STATEMENT > WHICHEVER ANSWERED OUT OF AISIZEA_1, TOP OF BAND AT AISIZEA_2 OR AISIZEB

FIELDNUM

[IF AISIZEB≠1 **How many have a higher education qualification in any of the following fields?**]

[IF AISIZEB=1 **Does this employee have a higher education qualification in any of the following fields?**]

READ OUT

- a. AI specifically
- b. Data science (but not specifically AI)
- c. Maths or statistics
- d. Computer science
- e. Engineering
- f. Physical sciences
- g. Social sciences (including economics)

1. ENTER NUMBER
2. DO NOT READ OUT: Don't know

ASK IF AI BUSINESS WITH 50+ EMPLOYEES IN AI ROLES, AND EMPLOYEES HAVE A HIGHER EDUCATION (CODES 2-7 AT ANY QUALSPER_{a-c})

SINGLE CODE

DISPLAY AS A GRID WITH CODES AS COLUMNS AND STATEMENTS AS ROWS

FIELDPER

Roughly what percentage have a higher education qualification in any of the following fields?

READ OUT

PROBE UNTIL YOU REACH THE RIGHT ANSWER

- a. AI specifically
- b. Data science (but not specifically AI)
- c. Maths
- d. Computer science
- e. Engineering
- f. Physical sciences
- g. Social sciences (including economics)

1. None of them
2. Under 10%
3. 10% to under 25%
4. 25% to under 50%
5. 50% to under 75%
6. 75% to under 100%
7. All, or virtually all of them (i.e. 100%)
8. DO NOT READ OUT: Don't know

SECTION 5: TRAINING

ASK IF KNOW HOW MANY EMPLOYEES ARE IN AI ROLES (DUMASIZEA NOT CODE 3 AND AISIZEB NOT DK)

AITRAINING

In the last 12 months, have these employees undertaken any internal or external training to improve their AI knowledge or skills?

1. Yes
2. No
3. DO NOT READ OUT: Don't know

ASK IF HAVE HAD EMPLOYEES RECEIVING TRAINING (CODE 1 AT AITRAINING)
DISPLAY AS A GRID WITH CODES AS COLUMNS AND STATEMENTS AS ROWS

TRAININGTYPE

Was any of this training that covered AI knowledge or skills...?

READ OUT

- a. Focused on developing technical knowledge or skills
 - b. Focused on bias in AI
 - c. Focused on ethics in AI
 - d. Part of a graduate training programme
 - e. Developed internally within the organisation
 - f. Developed externally outside of the organisation
 - g. Developed or delivered in partnership with a university or research institute
1. Yes
 2. No
 3. DO NOT READ OUT: Don't know

SECTION 6: RECRUITMENT AND SKILLS SHORTAGES

READ OUT TO ALL

RECRUITMENT

I'd now like to ask about recruitment.

ASK ALL

RECRUITAI

In the last 2 or so years, i.e. since the beginning of 2018, have you tried to recruit anyone with the knowledge or skills to work with AI models, tools or technologies? Please include any current vacancies.

1. Yes
2. No
3. DO NOT READ OUT: Don't know

ASK IF HAVE RECRUITED (CODE 1 AT RECRUITAI)

NUMERIC. MIN=1, MAX=99.

IF MICRO (CODE 1 AT FIRMSIZEBANDS) SOFT CHECK IF MORE THAN 5

IF SMALL OR MEDIUM (CODES 2 TO 5 AT FIRMSIZEBANDS) SOFT CHECK IF MORE THAN 10

IF LARGE OR UNKNOWN (CODES 6 TO 9 OR DK AT FIRMSIZEBANDS) SOFT CHECK IF MORE THAN 30

VACANCIES

How many vacancies have you had for these roles since the beginning of 2018?

PROBE FOR BEST ESTIMATE BEFORE CODING DK

1. ENTER NUMBER
2. DO NOT READ OUT: Don't know

ASK IF HAVE RECRUITED (CODE 1 AT RECRUITAI)

MULTICODE OK EXCEPT DK

DO NOT RANDOMISE

RECRUITMETHOD**Which recruitment methods have you used to find candidates for these vacancies?**

DO NOT PROMPT

PROBE FULLY (I.E. "ANYTHING ELSE?")

INTERVIEWER: IF RECRUITMENT AGENCY OR WEBSITE, PROBE WHETHER THIS WAS A GENERALIST AGENCY / SITE OR SPECIALIST TECH RECRUITER

Recruitment agencies

1. General recruitment agency
2. Specialist tech recruitment agency

Online / websites

3. Job ads on own website
4. Generalist recruitment websites (e.g. Reed / Indeed)
5. Specialist tech recruitment websites (e.g. Stack Overflow)
6. Posts or ads on social media (e.g. Facebook, Twitter, LinkedIn)
7. Posts or ads elsewhere online (e.g. Google)

Other methods

8. Apprenticeships
9. Ads in newspapers or magazines
10. Asking individuals to apply directly
11. Graduate schemes
12. Headhunting (not through a recruitment agency)
13. Internships
14. Partnering with schools/colleges
15. Partnering with universities
16. Recruiting from elsewhere in the organisation
17. Word of mouth / industry networks / recommendations
18. Other (SPECIFY)

19. Don't know

ASK IF RECRUIT IN MULTIPLE WAYS (MORE THAN 1 CODE SELECTED AT RECRUITMETHOD)
SINGLE CODE**MAINMETHOD****And which one of these recruitment methods would you say has been the most successful?**

DO NOT PROMPT

1. DISPLAY ALL CODES SELECTED AT RECRUITMETHOD
2. None of them
3. Don't know

ASK IF HAVE HAD VACANCIES (VACANCIES NOT DK)
NUMERIC. MIN=0, MAX=VACANCIES.**HARDTOFILL****[IF 1 AT VACANCIES Has this vacancy proved hard to fill for any reason? This is even if you have since filled this vacancy.]****[IF VACANCIES>1 How many of these [VACANCIES] vacancies, if any, have proved hard to fill for any reason? This includes vacancies that you may have since filled.]**

PROBE FOR BEST ESTIMATE BEFORE CODING DK

[IF 1 AT VACANCIES INTERVIEWER: WRITE IN "1" IF THIS VACANCY WAS HARD TO FILL; 0 IF IT WAS NOT]

1. ENTER NUMBER
2. DO NOT READ OUT: Don't know

ASK IF HAVE HAD HARD-TO-FILL VACANCIES (1 OR MORE AT HARDTOFILL)
MULTICODE OK EXCEPT DK, UP TO NUMBER AT HARDTOFILL**HTFLEVEL**

[IF 1 AT HARDTOFILL **What level of seniority was this hard-to-fill vacancy?**]
 [IF HARDTOFILL>1 **What levels of seniority were these hard-to-fill vacancies?**]

PROMPT TO CODE

1. Apprentice level
2. Entry-level or graduate
3. Senior level (typically with 3-5 years of experience)
4. Management or principal level (typically with around 6 to 9 years of experience)
5. Director level or higher (typically with 10+ years of experience)
6. DO NOT READ OUT: Don't know

ASK IF HAVE HAD HARD-TO-FILL VACANCIES (1 OR MORE AT HARDTOFILL)
 MULTICODE OK EXCEPT DK, UP TO NUMBER AT HARDTOFILL

HTFQUALIF

[IF 1 AT HARDTOFILL **What was the minimum qualification level that you were looking for when recruiting for this hard-to-fill vacancy?**]
 [IF HARDTOFILL>1 **What were the minimum qualification levels that you were looking for when recruiting for these hard-to-fill vacancies?**]

PROMPT TO CODE

1. A Levels
2. A Bachelor's degree
3. A Master's degree
4. A PhD
5. Any other technical qualification or certified training (SPECIFY)
6. DO NOT READ OUT: Don't know

ASK IF HAVE HAD HARD-TO-FILL VACANCIES (1 OR MORE AT HARDTOFILL)
 MULTICODE OK EXCEPT DK

HTFREASON

[IF 1 AT HARDTOFILL **For what reasons has this vacancy proved hard to fill?**]
 [IF HARDTOFILL>1 **For what reasons have these vacancies proved hard to fill?**]

DO NOT PROMPT
 PROBE FULLY (I.E. "ANYTHING ELSE"?)

Job not appealing

1. Competition from other employers
2. Job is difficult / challenging
3. Low pay or benefits / salary demand too high
4. Lack of prospects / career progression opportunities
5. Not offering training

Lack of suitable candidates

6. Candidates do not have required attitude / motivation / personality
7. Candidates do not match our culture
8. Lack of soft skills, e.g. communication skills
9. Lack of technical skills or knowledge
10. Lack of qualifications
11. Lack of work experience

Other reasons

12. Coronavirus / COVID-19
13. Hard to recruit non-UK nationals / visa requirements
14. Lack of candidates / applications
15. Location / poor transport links
16. Recruitment budget cuts
17. Other (SPECIFY)

18. Don't know

SECTION 7: SKILLS GAPS

READ OUT IF AN AI BUSINESS AND KNOW HOW MANY EMPLOYEES ARE IN AI ROLES (DUMAISIZEA NOT CODE 3)

SKILLSGAPSA

The next questions are specifically about the knowledge and skills of employees in AI-related job roles, and of job applicants for these roles.

READ OUT IF NOT AN AI BUSINESS AND KNOW HOW MANY EMPLOYEES ARE IN AI ROLES (AISIZEB NOT DK)

SKILLSGAPSB

The next questions are specifically about the knowledge and skills of the employees that have used AI models, tools or technologies in their work, and of job applicants for these roles.

ASK ALL

SINGLE CODE AND ALLOW REVERSED SCALE

RANDOMISE ORDER OF SETS OF STATEMENTS AND ORDER WITHIN SETS OF STATEMENTS

DISPLAY AS A GRID WITH CODES AS COLUMNS AND STATEMENTS AS ROWS

BARRIERS

To what extent, if at all, have any of the following issues affected your ability to meet your business goals across the last 2 or so years? That is, since the beginning of 2018.

READ OUT

SET 1

- a. A lack of candidates in the labour market for these roles that have the technical AI knowledge or skills that you need
- b. A lack of candidates in the labour market for these roles that have non-technical skills, such as communication, leadership or management skills

SET 2

- c. Your existing employees in these roles lacking the technical AI knowledge or skills that you need
- d. Your existing employees in these roles lacking non-technical skills, such as communication, leadership or management skills

1. To a great extent
2. To some extent
3. Not very much
4. Not at all
5. DO NOT READ OUT: Don't know

ASK IF HAD TECHNICAL SKILLS GAPS (CODES 1 OR 2 AT BARRIERSa OR BARRIERSc)

MULTICODE OK EXCEPT DK

RANDOMISE LIST EXCEPT OTHER AND DK

TECHNICAL

In which of the following areas have you experienced these technical AI knowledge and skills gaps?

READ OUT

1. Understanding of AI concepts and algorithms
2. User experience (UX)
3. Data management (e.g. harvesting, curation or cleaning)
4. Programming skills and languages
5. Statistics and probability
6. Data and compute infrastructure requirements
7. Software engineering
8. Data analytics
9. Distributed systems
10. Any other technical AI knowledge or skills areas (SPECIFY)
11. DO NOT READ OUT: Don't know

ROTATE ORDER OF NONTECH AND SENIOR

ASK ALL

SINGLE CODE AND ALLOW REVERSED SCALE
 RANDOMISE ORDER OF STATEMENTS
 DISPLAY AS A GRID WITH CODES AS COLUMNS AND STATEMENTS AS ROWS
NONTECH

Thinking about the typical employee working in an AI-related job role in your organisation, how good or poor would you say they are in terms of each of the following?

READ OUT

- a. Commercial awareness
 - b. Awareness of potential bias in the organisation's use of AI
 - c. Awareness of any privacy or ethical issues around the organisation's use of AI
 - d. Their ability to think critically and logically
 - e. Their commitment to self-learning
1. Very good
 2. Fairly good
 3. Neither good nor poor
 4. Fairly poor
 5. Very poor
 6. DO NOT READ OUT: Don't know

ASK IF LISTED ON SAMPLE AS DEVELOPING OR USING AI, BUT NOT AN AI BUSINESS (S_GROUP = _02 or _03)

SINGLE CODE AND ALLOW REVERSED SCALE
 RANDOMISE ORDER OF STATEMENTS
 DISPLAY AS A GRID WITH CODES AS COLUMNS AND STATEMENTS AS ROWS
SENIOR

How good or poor would you say your organisation's senior management are in terms of each of the following?

READ OUT

- a. Understanding the staffing needs of your team
 - b. Understanding how AI is being used within the organisation
 - c. Awareness of potential bias in the organisation's use of AI
 - d. Awareness of any privacy or ethical issues around the organisation's use of AI
1. Very good
 2. Fairly good
 3. Neither good nor poor
 4. Fairly poor
 5. Very poor
 6. DO NOT READ OUT: Don't know

ASK ALL

COVID

Considering the impact of COVID-19 on your organisation, as well as any other expected changes, is the demand for AI skills in your organisation likely to increase, stay the same or decrease over the next 12 months?

1. Increase
2. No change
3. Decrease
4. DO NOT READ OUT: Don't know

SECTION 8: STAFF TURNOVER

READ OUT TO ALL

STURNOVER

Finally, I'd like to ask about staff turnover in these AI-related job roles.

ASK LEFTA AND LEFTB AS A LOOP FOR EACH STATEMENT AT RETIREA

ASK ALL

DISPLAY AS A GRID WITH CODES AS COLUMNS AND STATEMENTS AS ROWS

NUMERIC. MIN=0, MAX=49.

IF MICRO OR SMALL (CODES 1 TO 3 AT FIRMSIZEBANDS) SOFT CHECK IF MORE THAN 3

IF MEDIUM, LARGE OR UNKNOWN (CODES 4 TO 9 OR DK AT FIRMSIZEBANDS) SOFT CHECK IF MORE THAN 19

LEFTA

In the last 18 months, how many employees in AI-related job roles, if any, have left your company for each of the following reasons?

READ OUT

- a. Retirement
- b. Dismissal
- c. Redundancy as a result of COVID-19
- d. Redundancy **not** as a result of COVID-19
- e. Of their own volition
- f. Came to the end of their fixed-term contract

1. ENTER NUMBER
2. DO NOT READ OUT: Don't know

ASK FOR EACH STATEMENT IF DON'T KNOW HOW MANY HAVE LEFT (LEFTAa-e CODE DK)
SINGLE CODE

LEFTB

Was it...?

PROBE FULLY, I.E. UNTIL YOU REACH THE RIGHT RESPONSE

1. None
2. 1 to 2
3. 3 to 4
4. 5 to 9
5. 10 to 14
6. 15 to 19
7. 20 to 24
8. 25 to 29
9. 30 or more
10. DO NOT READ OUT: Don't know

SECTION 9: RECONTACT

ASK ALL

QUAL

Thank you for taking part in this survey. Would you be willing to be contacted by Ipsos MORI in autumn 2020 about participating in a more in-depth interview on this topic? You do not have to commit to anything now, just indicate a willingness to be contacted again in the next few months.

ADD IF NECESSARY: The interviews would last no longer than 45 minutes and those taking part would be offered £50, paid to them or a charity of their choice.

1. Yes (CONFIRM NAME, JOB TITLE AND EMAIL ADDRESS)
2. No

ASK IF AN AI BUSINESS AND KNOW HOW MANY EMPLOYEES ARE IN AI ROLES OR NOT AN AI BUSINESS AND MORE THAN ONE EMPLOYEE IN AI ROLES (CODES 1 OR 2 AT DUMASIZEA OR AISIZEB>1)

RECONONLINE

We know that you may not have had all the answers to hand during this survey. Can we email you the link to a very short online form to give you the chance to submit those answers to us electronically? This would help us to ensure the data represents your organisation as accurately as possible.

1. Yes (CONFIRM NAME AND EMAIL ADDRESS IF NOT COLLECTED AT QUAL)
2. No

ASK ALL

REPORT

And would you like us to email you a copy of the survey findings, once these have been published?

1. Yes (CONFIRM NAME AND EMAIL ADDRESS IF NOT COLLECTED AT QUAL OR RECONONLINE)
2. No

READ OUT TO ALL

CATICLOSE

Thank you for taking the time to participate. You can access the privacy notice online at: [LINK](#). This explains the purposes for processing your personal data, as well as your rights under data protection regulations to:

- **access your personal data**
- **withdraw consent**
- **object to processing of your personal data**
- **and other required information.**

CLOSE CATI SURVEY

Appendix B: Topic guide for employers (AI firms, non-AI firms and public sector)

Introduction (2-3 minutes)

- Thank participant for taking part in quantitative survey (if applicable) and explain that DCMS wants to understand in more depth current and future AI and data science skills gaps, recruitment and training to help inform future government policy.
- Interview should last about 45 minutes to an hour depending on their answers and experiences.
- Incentives: as a thank you, a £50 incentive will be paid to the participant or a charity of their choice.
- **MUST GET PERMISSION TO DIGITALLY RECORD FOR ANALYSIS:** Explain recordings will be stored securely and only the research team at Ipsos MORI will have access to these.
- **MUST READ OUT AFTER STARTED RECORDING:** All responses are confidential and anonymous. DCMS won't know who has taken part **[with caveat that for public sector orgs they may have been invited to participate by DCMS]** and will get an anonymised report of the findings across all interviews. Participation is voluntary and you can change your mind at any time. Can I confirm you are happy to take part on this basis?
- If you would like to read the privacy policy before we continue, I can give you the link. If you're happy to proceed we'll continue. **ADD IF NECESSARY:** You can access the privacy policy on our website at: **ADD LINK**

Context (c.5 minutes – longer for non-AI firms)

- Tell me a bit about your organisation and your role within it. How long have you been with the organisation?
- *(Non-AI firms only)* Where do people working on AI and data science fit in to the structure of the organisation? Spontaneous first, then probe on:
 - Do they form a specific team or are they to be found working within different teams?
 - Do they typically focus on AI and data science exclusively, or have other areas of responsibility?
- *(Non-AI firms only)* How important would you say AI and data science is to the business?
 - Is it important to a specific part of business operations, or throughout?
 - Has this changed in recent years?
 - How do you expect this to change in the future? What makes you say that?
- *EITHER for non-AI firms:* To what extent are you involved in skills, training and recruitment decisions in your role? Who else makes decisions around skills, training and recruitment?
- *OR for AI firms:* How are you involved in skills, training and recruitment decisions? Who else makes decisions around skills, training and recruitment?

Skills gaps (c.10 minutes)

- (a) For non-AI firms, emphasise and clarify throughout that we are focusing only on AI and data science skills, not skills more broadly
- (b) Current skills
 - Could you give a brief overview of the most important AI and data science skills needed at your organisation?
 - *Refer to answer in survey.* To what extent is there a shortage of AI and data science skills in your organisation?

- *How do these AI and Data Science skills gap compare to gaps in other areas of your organisation? (e.g. Cloud Computing)*
 - How have these AI and Data Science skills gaps changed in the last 5 years?
 - Which AI skillsets or experience is your organisation looking to acquire? *Probe on technical skills, soft skills, and seniority.*
 - Are there needs which are particularly urgent at present?
 - *(If applicable) What would you say the main reasons are for this shortage of skills? Spontaneous first, then probe on factors such as:*
 - overall lack of candidates in the market
 - few applicants to their business in particular (if so, why)
 - high staff turnover
 - mismatched salary expectations
 - technically qualified candidates lacking other requisite skills (e.g. commercial awareness)
 - coronavirus (e.g. due to people being on furlough/redundant)
 - *(If applicable) What's the impact of these skills gaps or skills shortages on your business? What about on your staff? How serious is this impact?*
 - *What approaches does your organisation take to deal with skills gaps? Probe on hiring, developing existing staff, use of freelancers/consultants.*
 - To what extent do your teams have to take on multiple roles or adapt their working patterns to address skills shortages?
 - Why were these approaches chosen?
 - How well do they work for your business?
 - *To what extent have you outsourced elements of your work to meet your need for AI skills?*
 - Is this primarily due to skills shortages, or to other considerations?
 - What are the advantages and disadvantages of outsourcing?
 - Who in the business is responsible for outsourcing? How do you ensure they understand and communicate the business needs?
 - How well does it work for your business? From your experience, are there examples of areas where it has worked particularly well, or where you would avoid outsourcing in future?
 - *Refer to answer in survey.* In the survey, you said that your senior management were good/poor at understanding the staffing needs of your team in relation to AI. What makes you say that?
- (c) Upcoming skills gaps**
- Looking to the future, how do you think the skills needs of the organisation might change in the next five or ten years? Are shortages of the skills you will need likely to get better or get worse? What are the main reasons for that?
 - What impact is the coronavirus pandemic likely to have on your organisation's AI skills needs now and in the future?
 - What impact is exiting the EU likely to have on your organisation's AI skills needs now and in the future?
 - What *[other]* challenges do you foresee in the next five to ten years in meeting your organisation's AI skills needs?
 - What potential impact might these changes in skills needs and skills gaps have on your organisation? What steps is your organisation taking in relation to this?
- (d) Role of Government and industry**
- *(AI firms only)* What role do AI businesses like yours have in addressing AI skills gaps?
 - What role does the Government have? What steps should it be taking?

Recruitment (c.15 minutes)

- (e) For non-AI firms, emphasise and clarify throughout that we are focusing only on recruitment for AI and data science roles, not recruitment more broadly
- (f) Current recruitment approaches
- What would you say are the key considerations for your organisation when you are recruiting people for specialist AI roles?
 - How, if at all, does this vary at different levels?
 - *Refer to relevant answer in survey.* What kinds of recruitment approaches work best for you? What channels and services do you use?
 - How well do these work for your business?
 - What makes them effective *[or less effective if relevant]*?
 - How does this vary according to seniority of the role, or the types of experience you are looking to recruit?
 - To what extent do you recruit candidates from outside the UK?
 - To what extent has Brexit been an issue in terms of recruiting AI specialists? What impact do you think it will have in the future?
 - How do you try to attract candidates? *Probe on salary premiums, benefits, training opportunities, career progression.*
 - What would you say are the main reasons why AI candidates choose to join your organisation?
 - Do the salaries offered for AI specialists typically differ to those offered to other kinds of technical roles in businesses like yours (e.g. technical IT roles)? If so, what kinds of challenges or pressures does this create? How do you deal with this?
 - To what extent do you use internal recruitment for specialist AI roles? How effective has this been?
 - Similarly, have you recruited less experienced staff and then developed their skills? How successful has this been?
 - What are the pros and cons of developing skills and recruiting internally vs. bringing in skilled individuals through external recruitment?
 - How has the way your organisation approaches recruitment changed in recent years?
 - How has your approach to recruitment been affected by the coronavirus pandemic?
 - What sort of changes to your recruitment approach are you likely to see in the future? *Probe on technological advances, changing labour market*
 - To what extent is your organisation willing to use new approaches, even if these are untested? *Prompt on retraining, degree and non-degree apprenticeships, placement students.*
 - If hard-to-fill vacancies: You said in the survey that your organisation has found it hard to fill certain roles. Could you tell me more about this?
 - How have you dealt with it? Have you changed your approach?
 - What has worked well? What remains a challenge?
- (g) Recruitment criteria
- What do you typically look for in job candidates? How do you weight these different factors? *Probe on:*
 - *Experience vs. qualifications*
 - *Technical vs. soft skills vs. other qualities*
 - *Specialist vs. generalist skills.*
 - What makes people stand out? What traits are harder to come by?
 - What do you emphasise in your job descriptions/listings? Is this reflected in the candidates you get?

- (Non-AI firms only) How do you ensure that HR/those responsible for recruitment understand what you are looking for in job candidates, and communicate this effectively?
 - How do you assess whether candidates have the skills you are looking for? How easy or difficult is this?
 - Have you used any skills or roles frameworks to guide recruitment? How useful are these?
 - What kinds of formal qualifications does your organisation look for?
 - What are your minimum educational requirements for job candidates? What made you settle on this?
 - How about specific qualifications or certifications?
 - What qualifications stand out in the market, if any?
 - What do these qualifications add? How are they different from other AI-related qualifications?
 - In general, how helpful are formal qualifications as a guide to whether candidates will have the skills you are looking for? *Probe on different types of skills*
 - In particular, to what extent do graduates of relevant university courses have the skills you need?
 - Has this changed over time?
 - What impact, if any, do you expect the coronavirus pandemic to have on courses and formal qualifications?
- (h) Role of Government**
- What role does the Government have in making it easier to recruit new staff for AI specialist roles? What steps could they take? What support could they offer?

Retention (c. 5 minutes)

- How would you describe the level of turnover among your AI specialist staff? How does this compare to staff turnover among your other staff/ (if AI firm) the wider tech sector? What do you think the reasons for that are?
- What would you say are the main reasons that staff in AI roles have previously left the organisation?
- To what extent does this level of turnover cause a problem for your business? In what ways?
- How do you try to retain AI specialists within your business? What can and can't you do? *Probe on salary premiums, benefits, training opportunities, career progression.*
- What works best for you to retain staff with AI specialist skills? What makes these approaches effective? Does this vary by role or seniority?

Training (c.10 minutes)

- (i) Training requirements**
- What are your business's needs in respect of training and upskilling for existing staff working on AI projects? What are the main areas they need training in? *Probe for technical skills and soft skills. Note any specific technical categories.*
 - What makes these areas so important/a focus?
 - How do you assess these needs? Has the business done a formal analysis of this in the last few years?
 - What training in AI and related skills do you offer to your employees? What levels do you offer this at?
 - What role do AI-related qualifications or certified training play in training and upskilling your employees?
 - Have you used any skills or roles frameworks for guiding training before? How useful are these?
 - *[If not already mentioned]* What are your expectations of staff in terms of their knowledge and awareness of ethics in AI? How do you ensure these expectations are met?

- To what extent does the training you offer cover ethical considerations? *[If at all]* How is this covered? *Probe on reasons for including or not including ethical elements in training*
 - How do you facilitate training for your staff in AI and related skills?
 - What balance do you strike between formal training and informal, on-the-job training?
 - What formats do you typically use – in-person, webinars, self-directed online courses, etc.? How has this been affected by the coronavirus pandemic?
 - Which elements of the more formal training are developed and delivered in-house and which are external? What is behind this choice?
 - What challenges have you faced in finding appropriate options for training? *Probe on cost, ease of access/flexible delivery, relevance to their needs*
 - What are the advantages of internal/external training? What do you think of external AI training providers? To what extent does their offer meet your needs?
 - Have you ever worked in partnership with other organisations, e.g. universities, colleges, to help train staff? Have you considered anything like this? What have been the benefits? What are the challenges?
 - How do you evaluate the training given to staff? How effective is it, in your opinion, at meeting your organisation's overall training and skills needs?
 - Where are the gaps in your training? What improvements would you like to see? What changes are you planning or considering?
 - How have your training needs evolved over time? What changes have you made to training over time?
 - In what ways has your approach to training been affected by the coronavirus pandemic?
- (j) Role of Government**
- What role can the Government have in supporting training and upskilling in firms like yours and in the industry? What steps can it take? What support can it offer?
 - Have you heard of/are you involved in any Government-sponsored schemes for AI or data science skills and training? What has your experience of these been? How useful are schemes like this? What can be improved?

Diversity (c.10 minutes)

For non-AI firms, emphasise and clarify throughout that we are focusing only on the team/staff who work on AI and data science projects – may need to adapt wording accordingly based on participant's language in introductory section, e.g. using "team" instead of "workforce"

- How diverse would you say your workforce is? What makes you say that? *Get spontaneous response first, then probe on gender, ethnicity, social class, neurodiversity.*
- How much attention do you pay to diversity? What monitoring do you do?
- What impact does a more diverse workforce have? How do you observe this in your organisation?
- What steps, if any, does your organisation take to encourage diversity: *E.g. changed or adapted your recruitment processes, or carried out any specific activities to encourage applications from the following groups: women, people from ethnic minority backgrounds, people with neurodiverse conditions or learning disorders, such as autism, Asperger syndrome, dyslexia, dyspraxia and attention deficit hyperactivity disorder (ADHD).*
 - when recruiting staff?
 - when considering approaches to staff retention and career progression?
- *(If they have taken some actions)* What steps have been taken? *Probe on each group mentioned.*
 - What were the reasons for taking these steps?
 - How effective have these been? How have you evaluated these initiatives?
 - What other plans do you have?
 - *(If not)* Why is that? How might that change in the future?

- In your opinion, how much responsibility for this lies with organisations like yours?
- To what extent does your organisation measure salary disparity for diverse groups? What, if any, disparities have been identified? *If there are disparities:* And what, if any, action has been or will be taken as a result?
 - *If mentioned salary premiums in recruitment section:* What impact, if any, do you think the salary premiums you mentioned have on salary disparity?

Wrap-up (2-3 minutes)

- Is there anything that we haven't discussed that you would like to raise?
- Overall, what do you think is the one thing I should take away from the discussion today? What advice would you give to the Government to ensure the AI labour market meets the needs of your business?
- *Get details for £50 thank you incentive (FOR PUBLIC SECTOR ORGANISATIONS THIS WILL BE £50 TO A CHARITY OF THEIR CHOICE)*
- *Ask participant:* As part of this research, we are looking to interview professionals working in AI at different levels, not only those who are team leaders or make recruitment decisions. With this in mind, is there anyone on your team who you think would be interested in taking part and whom we could approach for an interview? If so, we'd be very grateful if you could put us in touch. Of course, we will keep anything they discuss with them, including whether or not they ultimately take part in the research, confidential. If they do take part, they would also receive a £50 thank you payment.
- *Thank and close.*

Appendix C: Topic guide for Employees

Introduction (2-3 minutes)

- Thank participant for taking part. Explain that we are undertaking research for DCMS about the labour market for people with AI skills. We therefore want to speak to people working in AI to learn about their careers and the path they took to their current role, as well as getting views on the labour market more widely. This will help inform future government policy.
- Interview should last about 45 minutes depending on their answers and experiences.
- Emphasise that this is a research interview and there are no right or wrong answers. We are interested in your views and experiences, so please be as honest as possible. Individual responses will not be shared with anyone outside the research team at Ipsos MORI.
- Incentives: as a thank you, a £50 incentive will be paid to the participant or a charity of their choice.
- **MUST GET PERMISSION TO DIGITALLY RECORD FOR ANALYSIS:** Explain recordings will be stored securely and only the research team at Ipsos MORI will have access to these.
- **MUST READ OUT AFTER STARTED RECORDING:** All responses are confidential and anonymous. DCMS won't know who has taken part and will get an anonymised report of the findings across all interviews. Participation is voluntary and you can change your mind at any time. Can I confirm you are happy to take part on this basis?
- If you would like to read the privacy policy before we continue, I can give you the link. If you're happy to proceed we'll continue. **ADD IF NECESSARY:** You can access the privacy policy on our website at: **ADD LINK**

Introduction (c.5 minutes – longer for employees of non-AI firms/public sector)

- Tell me a bit about your work at [employer].
 - What does the organisation do? Who are its clients/customers?
 - How long have you been with the organisation?
 - What is your role specifically?
- Does your role focus on AI and data science exclusively, or do you have other areas of responsibility?
- *(Non-AI firms only)* How important would you say AI and data science is to the business?

Career pathway – description (5 minutes)

- What is your background - have you always been doing this kind of work?
- What were you doing before this job?
 - *(If previously working)* How similar or different was that role in terms of the skills needed?
- What was it that made you seek a career in AI?
- And what was it that led you to take the job you have now?
 - Factors related to the role/work itself
 - Factors related to the organisation/employer
- How were you recruited? Where did you hear about the opportunity?
 - If they used a recruiter/agency – how well do you feel they understood your background/skills and the kind of role you wanted?

Note that we will return to reflect on their career towards the end of the interview, but that we want to ask some more specific questions first.

Education, training and professional development (15 minutes)

- We understand that the background of people working in this field can be very varied in terms of the mixture of formal education, less formal training, and learning on the job. In what ways did you acquire the skills you have to do your current job? *Spontaneous first before proceeding to the below:*
- Have you ever attended university? PROBE: which university, whether as undergraduate or graduate
- Did you take a specific course or qualification in AI at university? *If so:*
 - What led you to take this course? Why this one in particular?
 - In your view, how important has this qualification been to your career?
 - Based on your experience since, are there aspects of the course you would change, such as topics you wish had been included?
 - To what extent did the course cover ethics in AI? How do you feel about this?
- *(If not taken an AI-specific course at university)*
 - What were the reasons behind this?
 - Do you feel that this has caused you any disadvantage in your career to date?
- Have you taken any less formal courses, such as short courses or online courses, other than those provided by your employer? *If so:*
 - What motivated you to do this?
 - How did you choose a course to take? What was it about the course that interested you?
 - How well did the course meet your needs? *Probe on content/coverage; quality of teaching; relevance to their situation*
 - *(If not)* What are the reasons for this?
- What training does your employer offer, if any?
 - Does the training from your employer cover technical skills, non-technical “soft” skills, or both? To what extent is ethics covered?
 - What do you think of the quality of this training? How relevant is it to your role?
 - Is there any training would you like your employer to provide that isn’t currently available?

Future plans, including employer’s internal recruitment and retention strategies (5-10 minutes)

Remind participants of confidentiality/anonymity and that findings are reported in aggregate

- Do you have a view on where you want to go next in your career? What are the factors behind this?
- Is there a clear pathway for career progression for people doing roles like yours? *Probe on both within employer and more widely.*
- How long do you see yourself staying in your current role? What makes you say that? What are the pros and cons of working there?
- To what extent is it possible to progress in your career at your current employer? What internal promotion or job changing opportunities are there?
- To what extent, if at all, have you considered working abroad, or outside of the UK?
 - Where have you considered working? E.g Europe, Asia, USA
 - What do you see as the benefits of working abroad, compared to staying in the UK? What are the benefits of staying in the UK? PROBE: salary, benefits etc
- As far as you know, is your organisation affected by a shortage of people with AI and data skills? *(If so:)* What effect does this have on the organisation? And on you personally?
- As far as you know, in what ways does your employer try to retain staff?
 - How successful is this, in your view?

Wider reflections on the industry (5 minutes)

- Thinking about the labour market in general, what's your perception of the demand for people with skills like yours?
 - What makes you say that/think that?
 - What do you think the reasons for that are?
 - How do you see that changing over time? *Probe on impact of Coronavirus; EU Exit*
- Based on your experiences, to what extent is there availability of AI jobs near to where you live?
 - Which areas do you think most AI jobs are based in?
 - To what extent is this a problem for you?
- How diverse do you think the AI workforce is in general? *Get spontaneous response first, then probe on gender, ethnicity, social class, neurodiversity.*
- And how diverse is the AI team/workforce at your employer? What makes you say that?
 - As far as you know, has your employer taken any steps to encourage a more diverse workforce?

Wider reflections on their career (3-4 minutes)

We are coming towards the end of the interview, and I wanted to ask some broader questions about your career.

- What challenges have there been in the course of your career? What obstacles have you had to overcome? *For example: lack of information about working in this field; difficulty accessing training or judging its quality; lack of professional networks*
- *(Adapt according to demographics)* Do you think getting to where you are now in your career has been easier or more difficult as a woman; as a Black person?
- Is there anything [else] about your background or who you are that you think has made things easier or more difficult for you?
- What challenges, if any, do you think you may face in the future in terms of progressing in an AI career? What makes you say that?
- What support do you think would have been/would be useful in overcoming these challenges? Who do you think is best-placed to provide such support?

Role of Government and industry (2-3 minutes)

Refer back to any problems/issues identified in previous answers.

- What role do you think Government has to play in addressing some of the issues you've mentioned? What steps should it be taking?
- And what role do employers have, in your view?

Wrap-up (2-3 minutes)

- Is there anything that we haven't discussed that you would like to raise?
- Overall, what do you think is the one thing I should take away from the discussion today? What advice would you give to the Government?
- *Get details for £50 thank you incentive*
- *Thank and close.*

Appendix D: Topic guide for Aspiring Employees

Introduction (2-3 minutes)

- Thank participant for taking part. Explain that we are undertaking research for DCMS about the labour market for people with AI skills. We therefore want to speak to people who are interested in a career in AI to learn about their experiences to date in getting into the sector, as well as getting views on the labour market more widely. This will help inform future government policy.
- Interview should last about 30 - 45 minutes depending on their answers and experiences.
- Emphasise that this is a research interview and there are no right or wrong answers. We are interested in your views and experiences, so please be as honest as possible. Individual responses will not be shared with anyone outside the research team at Ipsos MORI.
- Incentives: as a thank you, a £50 incentive will be paid to the participant or a charity of their choice.
- **MUST GET PERMISSION TO DIGITALLY RECORD FOR ANALYSIS:** Explain recordings will be stored securely and only the research team at Ipsos MORI will have access to these.
- **MUST READ OUT AFTER STARTED RECORDING:** All responses are confidential and anonymous. DCMS won't know who has taken part and will get an anonymised report of the findings across all interviews. Participation is voluntary and you can change your mind at any time. Can I confirm you are happy to take part on this basis?
- If you would like to read the privacy policy before we continue, I can give you the link. If you're happy to proceed we'll continue. **ADD IF NECESSARY:** You can access the privacy policy on our website at: **ADD LINK**

Introduction (10 minutes)

- Tell me a bit about yourself and how you spend your time day-to-day. Are you currently working, studying, looking for a job, on furlough, something else? *Refer to answer from screener*
- I understand you are interested in a career in AI. What is it that interests you in this type of work?
 - What kind of role are you interested in in particular? *Probe on near future and longer-term*
 - And do you have a view on the kinds of employers you would like to work for (larger/smaller, public/private sector, tech sector vs. other)? What makes you say that?
- Have you ever worked in an AI or data science role before? Can you tell me a bit about this? **PROBE:** fully on the nature of the role, what they liked about this job, and why they are no longer in this role
- What actions have you taken to find out about a career in AI? (e.g. *online research, attending events, joining groups, speaking to people who work in this sector*)
- What steps have you taken to work towards a career in AI? (e.g. *taking courses, applying for jobs*) Talk me through your experiences to date.
 - And what will your next steps be? *Probe to get a sense of whether they have a longer-term career plan in mind.*

If currently working (5 minutes)

- Tell me a bit about your current job.
 - What does the organisation do? Who are its clients/customers?
 - How long have you been with the organisation?
 - What is your role specifically?
- What is your background - have you always been doing this kind of work? (*If previously working*) How similar or different was that role in terms of the skills needed?
- To what extent do you think your experience in this role will be transferable to working in AI? What makes you say that?

- What skills have you developed in this role that are transferrable? PROBE: understanding of AI tools and techniques, technical skills, commercial understanding, soft skills and understanding of ethics in AI
- And what about your professional background more generally?

Education, training and professional development (10 minutes)

Adapt tenses/wording depending on participant's situation

- In what ways have you sought to acquire the skills needed for a career in AI? *Spontaneous first before proceeding to the below.*
- What's the balance been between formal training, self-directed training and learning on the job?
- Did you take a specific course or qualification in AI at university? *If so:*
 - What led you to take this course? Why this one in particular?
 - In your view, how important will this qualification be in securing the kind of role you want?
 - Are there aspects of the course you would change, such as topics you wish had been included?
 - To what extent did the course cover ethics in AI? How do you feel about this?
- *(If not taken an AI-specific course at university)*
 - What were the reasons behind this?
 - Do you feel that this will cause you any disadvantage in getting the kind of role you want?
- Have you taken any less formal courses, such as short courses or online courses, to improve your AI skills? *If so:*
 - What motivated you to do this?
 - How did you choose a course to take? What was it about the course that interested you?
 - How well did the course meet your needs? *Probe on content/coverage; quality of teaching; relevance to their situation*
 - *(If not)* What are the reasons for this?
- What other training have you had that could be relevant to a career in AI, for example from your current employer?
 - What do you think of the quality of this training? How relevant is it to your career aspirations?
 - Is there any training would you like your employer to provide that isn't currently available?
- Once you are working in AI, how do you foresee keeping your skills up to date? *Probe on expectations of training from employer vs. self-directed study.*

Wider reflections on the industry (5 minutes)

- Thinking about the labour market in general, what's your perception of the demand for people with AI skills?
 - What makes you say that/think that?
 - What do you think the reasons for that are?
 - How do you see that changing over time? *Probe on impact of Coronavirus; EU Exit*
- Based on your experiences, to what extent is there availability of AI jobs near to where you live?
 - Which areas do you think most AI jobs are based in?
 - To what extent is this a problem for you?
- As far as you can tell based on your experiences, what are employers looking for? Are there particular skills or attributes that seem more in demand than others? *Probe on soft skills as well as technical skills.*
- How diverse do you think the AI workforce is in general? *Get spontaneous response first, then probe on gender, ethnicity, social class, neurodiversity.*
 - What makes you say that?

- What do you think the reasons are for that?

Wider reflections on their career (3-4 minutes)

We are coming towards the end of the interview, and I wanted to ask some broader questions about your career.

- What challenges have you experienced so far in working towards a career in AI? What obstacles have you had to overcome? *For example: lack of information about working in this field; difficulty accessing training or judging its quality; lack of professional networks*
- *(Adapt according to demographics)* Do you think working towards a career in AI has been easier or more difficult as a woman; as a Black person?
- Is there anything [else] about your background or who you are that you think has made things easier or more difficult for you?
- What challenges, if any, do you think you may face in the future in terms of progressing in an AI career? What makes you say that?
- What support do you think would have been/would be useful in overcoming these challenges? Who do you think is best-placed to provide such support?

Role of Government and industry (2-3 minutes)

Refer back to any problems/issues identified in previous answers.

- What role do you think Government has to play in addressing some of the issues you've mentioned? What steps should it be taking?
- And what role do employers have, in your view?

Wrap-up (2-3 minutes)

- Is there anything that we haven't discussed that you would like to raise?
- Overall, what do you think is the one thing I should take away from the discussion today? What advice would you give to the Government?
- *Get details for £50 thank you incentive*
- *Thank and close.*

Appendix E: Topic guide for Recruiters

Introduction (2-3 minutes)

- Thank participant for taking part and explain that DCMS wants to understand current and future AI and data science skills gaps, and challenges during recruitment, to help inform future government policy.
- Interview should last about 45 minutes to an hour, depending on their answers and experiences.
- Incentives: as a thank you, a £50 incentive will be paid to the participant or a charity of their choice. Will get an anonymised report of the findings across all interviews.
- **MUST GET PERMISSION TO DIGITALLY RECORD FOR ANALYSIS:** Explain recordings will be stored securely and only the research team at Ipsos MORI will have access to these.
- **MUST READ OUT AFTER STARTED RECORDING:** All responses are confidential and anonymous. DCMS won't know who has taken part. Participation is voluntary and you can change your mind at any time. Can I confirm you are happy to take part on this basis?
- If you would like to read the privacy policy before we continue, I can give you the link. If you're happy to proceed we'll continue. **ADD IF NECESSARY:** You can access the privacy policy on our website at: **ADD LINK**

Context (c.5 minutes)

- To start with, could you tell me a bit about your organisation and your role within it? How long have you been with the organisation?
- Which sectors and industries does your organisation operate in? How specialised are you with tech sector recruitment? And specifically AI and data science recruitment?
- How many years of experience does your team have in tech recruitment? And how much experience does your team have in AI and data science recruitment?
- How does your organisation recruit the 'right' type of staff for this job? Probe on: prior experience in tech/AI. Also probe on any training they receive on understanding clients' needs

Working with clients (c.5-10 minutes)

- How would you describe your clients or the types of organisations that you help recruit for? Probe on:
 - Size
 - Tech firms vs non-tech firms (or if a specialist tech recruiter, then the proportion of firms specialising in AI vs. others)
 - Geographical spread
- Who within your clients' organisation do you typically deal with when supporting their recruitment needs (e.g. HR department, team lead, Director)?
- How well do you think HR/those responsible for recruitment understand the businesses' AI skills needs and what they are looking for in an ideal candidate?
- What do your clients emphasise in their job descriptions/listings? Is this reflected in the candidates you see?
- How easy or difficult do your clients find it to define which skills they are looking for? How do they communicate these with you?
 - Ask them to briefly talk through the process of drawing up a job description/listing and understanding client needs
 - What works well? What works less well?
 - Are there any ways in which this could be improved? What could be done better?
- Could you give a brief overview of the most important AI and data science skills that your clients look for in potential candidates?
 - Probe on: qualifications, technical experience, industry experience

- How does this vary by role?
- How has this changed over time? What are your expectations of future needs?
- What impact has the coronavirus pandemic had on clients' skills needs, now and in the future?
- What impact is exiting the EU likely to have on clients' skills needs, now and in the future?
- How much weight do clients tend to put on formal qualifications vs. other criteria?
 - Do clients typically set minimum qualification requirements or other specific requirements for formal qualifications? What are these?
 - Are certain qualifications (subjects/universities) particularly well-regarded by employers?
 - How important to employers are less formal training/qualifications (such as those not awarded by a university)? How much difference would these make on a candidate's CV?
- Aside from these skills, what other considerations do your clients have when recruiting people for specialist AI roles? *Probe on:*
 - *Technical vs. soft skills vs. other qualities*
 - *Suitability of candidate / how well they would fit in environment*
 - *Any other personality traits / qualities*
- What are the main reasons that your clients give for rejecting candidates for AI and Data Science roles?
 - *Probe on: lack of technical understanding, industry/commercial experience, suitability of fit within team, salary expectations etc*
- How easy or difficult do you find it to meet these employer demands from the current AI/data science candidate pool?
 - How realistic are their expectations?
 - Any particular demands/expectations employers have which are harder to meet or unrealistic?

Candidate pool (c.10 minutes)

Reiterate anonymity and confidentiality

- Could you tell me roughly how many candidates you have in your books, who are actively looking to get an AI or data science job, or move jobs? And how many are not actively looking to get a job/move jobs (i.e. more passive)?
 - Have these numbers changed recently? In what ways E.g., due to COVID-19.
 - What is the typical education level that these candidates have?
 - How much industry experience do these candidates typically have?
 - Where are they based geographically? *Probe on both location within the UK and proportion of candidates based overseas*
- How has the candidate pool changed over the past five years? How is it likely to change in the next five years? *Why?*
- In what ways, if any, has COVID-19 impacted the candidate pool?
- And what about Britain's exit from the EU? How has this affected the pool? How might it impact the pool in the future?
- Could you describe for me the methods you use to source good quality AI candidates? (e.g., LinkedIn, Indeed)
 - What have you found to work best?
 - What approaches have you tried that worked less well?
- What makes people stand out? What traits are harder to come by?
 - Has this changed in recent years?
 - How do you expect this to change in the future? What makes you say that?
- What would you say are the most common features that candidates look for in a potential employer? What appeals to them the most? What appeals the least?

- How realistic are candidates' expectations:
 - About salary?
 - About the types of roles which they are qualified for, based on their education/training?
- What are the typical reasons candidates give you when they're looking to leave their current role?
 - Roughly what proportion of these are in non-AI/data science roles?

Recruitment (c.10 minutes)

- In your experience, which types of candidates tend to be the most successful? Probe on:
 - *Experience vs. qualifications*
 - *Technical vs. soft skills vs. other qualities*
 - *Specialist vs. generalist skills.*
 - *Demographics*
 - *Geography*
- Which candidates tend to be the least successful, or take longer to place?
- Have there been any particular roles/grades that you have found more challenging to fill?
 - How have you dealt with these?
 - Have you changed your approach with your clients?
 - What has worked well?
 - What remains a challenge?
- What would you say are the main barriers or challenges that your clients face in meeting their skills needs?
- In your experience, what strategies do your clients tend to approach to fill these gaps? E.g. outsourcing work or recruiting from overseas?
- As far as you know, how have clients' recruitment strategies changed in recent years? And how are they likely to change in the future? Probe on:
 - EU Exit
 - technological advances
 - changing market conditions (e.g. remote working)
- What sort of changes to the recruitment approach would you like to see in the future/you think are necessary?

Diversity (c.10 minutes)

- How would you describe the diversity of the candidate pool currently available?
 - How often are candidates from the similar backgrounds (e.g. same university, type of degree)? If so, why do you think that is?
 - What proportion of the candidates are from:
 - BAME backgrounds? Which ethnic groups are more/less represented?
 - What about female vs male?
 - And neurodiversity candidates?
 - And candidates with physical disability?
- What reasons, if any, might candidates from certain groups be less successful than others?
 - What are the main barriers or challenges for candidates from less-represented groups?
- What do you think can be done to overcome this?
- To what extent do you feel you have responsibility, as a recruiter, to encourage diversity in the sector? What makes you say that?
- If at all, do you do anything to encourage candidates from groups which are less represented in AI/data science to enter/continue in the industry? *E.g. altering communication styles, application processes, where you recruit from etc.*
- What strategies or processes are you aware of that other recruitment agencies use to help make the sector more diverse?
- In what ways, if any, do your clients monitor the diversity of their applicants? Are there any quotas clients ask for? How does this vary by seniority level?

- Could you tell me a bit about the strategies that your clients use to improve workforce diversity? How is this likely to change in the future?
- What do you see as the Government's role in helping to make the sector more diverse?

Wrap-up (2-3 minutes)

- Is there anything that we haven't discussed that you would like to raise?
- Overall, what do you think is the one thing I should take away from the discussion today? What advice would you give to the Government to ensure the AI labour market meets the needs of your clients?
- *Get details for £50 thank you incentive*
- *Thank and close.*

Appendix F: Topic guide for Universities & Training Course Providers

Introduction (2-3 minutes)

- Thank participant for taking part and explain that DCMS wants to understand current and future AI and data science skills gaps, and training to help inform future government policy.
- Interview should last about 45 minutes, depending on their answers and experiences.
- Incentives: as a thank you, a £50 incentive will be paid to the participant or a charity of their choice.
- **MUST GET PERMISSION TO DIGITALLY RECORD FOR ANALYSIS:** Explain recordings will be stored securely and only the research team at Ipsos MORI will have access to these.
- **MUST READ OUT AFTER STARTED RECORDING:** All responses are confidential and anonymous. DCMS won't know who has taken part and will get an anonymised report of the findings across all interviews. Participation is voluntary and you can change your mind at any time. Can I confirm you are happy to take part on this basis?
- If you would like to read the privacy policy before we continue, I can give you the link. If you're happy to proceed we'll continue. **ADD IF NECESSARY:** You can access the privacy policy on our website at: **ADD LINK**

Context and training offer (c.20 minutes)

- Could you tell me a bit about your organisation and your role within it? How long have you been with the organisation?
- In your experience, what would you say are the most common pathways into a career in AI or data science?
- What kinds of tech/AI and data science courses / products and services do you currently offer?
 - How would you categorise these? Probe: By training content, delivery channel, who it's targeted at etc.?
 - Who are these courses / products aimed at? Who are your main users/students? Probe: age or experience level. Probe specifically on their offering for individuals seeking to move into AI/data science from another industry/background
 - How specialised or broad is your offering?
 - Do you provide any other types of courses / products not related to AI/data science? Roughly what proportion of your total offering is in the AI and data science space?
 - To what extent does the training/courses you offer cover ethical considerations? [If at all] How is this covered? Probe on: reasons for including or not including ethical elements in training
- Could you tell me about how these courses / products are delivered?
 - What formats do you typically use – in-person, webinars, self-directed online courses, etc.? How has this been affected by the coronavirus pandemic? How has this been affected by the EU exit?
 - To what extent has your offering adapted to technological advances or changing labour market conditions?
- **PROVIDERS:** What are the advantages of clients coming to you for their training needs, rather than developing their own training internally? To what extent does your offer meet their needs?
- What challenges have you faced in finding suitable students/clients for training? Probe on: cost, ease of access/flexible delivery, relevance to their needs
- Could you describe to me where your organisation fits into the rest of the AI and data science (training) market?

- What is the industry like? E.g. Lots of small providers offering niche products/services, or a few all-round providers offering a range of solutions?
- Who are your main competitors? What sets you apart from them? E.g. What do you offer that they don't? What do they offer that you don't?
- PROVIDERS: What is your business model? What made you go with this approach? How is this similar/different to other providers?
- What kinds of other models/provision/courses are out there?
- Does your training/courses lead to any qualifications?
 - Which qualifications?
 - How much does this matter to clients/employers? What difference would it make if students didn't emerge with a qualification? What kinds of clients/employers does this appear more/less to?
- PROVIDERS: How scalable is your offer? How easily could you expand to serve more clients?
 - How easily or quickly do you think you could do this?
 - Probe: on constraints/challenges to scaling up (e.g. staff numbers, their own skills shortages/gaps, investment/access to finance)
 - What actions would you need to take to grow supply?
- How do you see demand from students/employers changing over the next 2 to 5 years?
 - Are there any particular types of training increasing in demand? Probe on: move to products or services? Move towards/away from tailored training? Need for cheaper/broader training? Demand from new types of businesses (e.g. size and sector)?
 - What innovation is taking place in the market? New delivery channels/products/ services? Where is the demand coming from for these new things?
 - Have you taken any actions in anticipation of these changes? Have you made any changes in anticipation, e.g. new courses/ products/services? Are you planning to do this?

PROVIDERS ONLY: Clients and demand (c.15 minutes)

- How would you describe your "typical" clients?
 - Probe: if mainly organisations or individuals who come to you directly?
 - Probe: size or sectors of clients. Do different sizes/sectors have different needs?
 - Probe: Geographical locations. What is driving these locations? How feasible is it to go wider than this? Probe on: digitalisation of courses / products e.g. webinars
- How big is your demand currently?
 - Probe: on the scale of their offer i.e. what volume of clients they can/do service.
- How do clients typically find you?
 - Probe: through word-of-mouth, internet searching, direct marketing etc.
- What is your understanding of your clients' training needs?
 - What are the most common areas of AI and data science that clients want training on?
 - To what extent are your clients interested in training around softer skills e.g. project management, communication, team working skills?
- IF NOT COVERED ALREADY: How have your clients' needs changed over the past few years? What do you expect over the next 5 to 10 years?
 - In what ways, if any, are you adapting your courses and accreditation standards to meet changing needs?
- How aware are clients of their own training needs?
 - How informed are clients when choosing training products and services?
 - To what extent do your clients know from the start what kind of training they want? To what extent do you work with them to suggest what kind of training the client might want/need?

- Ask them to briefly talk through the process of understanding what clients are interested in, and their needs
- If you are dealing with individuals directly, how informed are they when choosing training products and services?

UNIVERSITIES ONLY: Employers and demand (c.10 minutes)

- What is your understanding of Industry/employers' recruitment needs?
 - What are the most common areas of tech/AI and data science that employers are interested in recruiting for?
 - To what extent are employers interested in softer skills e.g. project management, communication, team working skills?
 - To what extent are employers interested in ethics in tech and AI?
- IF NOT COVERED ALREADY: How have Industry needs changed over the past few years? What do you expect over the next 5 to 10 years?
 - In what ways, if any, are you adapting your courses and accreditation standards to meet changing needs?
- How, if at all, does the university get feedback from employers on the graduates you are producing, and whether they are meeting their employers' needs etc
 - Probe: what has changed as a result of this feedback?
- To what extent have you modified your courses to reflect these needs? Probe on: sandwich courses/placements, teaching softer skills, ethics etc
- To what extent have you changed the types of students that you accept, or your entry requirements, to meet Industry needs? Probe: what they prioritise (e.g. types of A levels, personal characteristics)

Partnerships, initiatives and diversity (c.15 minutes)

Partnerships

- Have you ever worked in partnership with other organisations, e.g. (other) universities, colleges, to help develop or deliver your courses/products?
 - Have you considered anything like this?
 - What have been the benefits? What are the challenges?
 - IF YES:
 - What are the most important impacts you think come out of this partnership?
 - What are the challenges?
 - To what extent does this partnership help to provide a route into industry for training recipients? i.e. placements for trained individuals in jobs/work experience
 - Are you collaborating with businesses to offer them any tailored products or services?
 - How does the partnership help tackle skills shortages, if at all? Probe: extent to which this helps the participant better align their training with industry needs

Initiatives

- Are you involved in any Government-sponsored schemes for AI and data science training?
 - Which ones?
 - What do you feel has changed as a result of the scheme, e.g. has it increased provision of products/services or do you offer a new product/services?
 - What have been the limitations or drawbacks of the scheme, if any?
- What do you see as the role of Government in supporting training providers/universities to meet clients' needs?
 - What support has been most effective so far?
 - What else would you like to see? What support would be more beneficial?

Diversity

- UNIVERSITIES: To what extent does the university monitor the level of diversity among applicants and/or students?
 - Probe: to what extent would you say that minority groups (such as women, ethnic minorities, individuals with disabilities) are actually applying?
- To what extent do your training courses/products/services focus on improving diversity and accessibility in the sector?
 - What initiatives do you have in place?
 - How does this work? Have you moved away from traditional learning methods to support this? What has worked well?
 - How has it broadened participation, if at all? Any examples of where it has led to people considering AI/data science as a career where they might not have before?
 - What are the barriers or challenges around doing this?

Wrap-up (2-3 minutes)

- Is there anything that we haven't discussed that you would like to raise?
- Overall, what do you think is the one thing I should take away from the discussion today? What advice would you give to the Government to support your organisation to meet the needs of you're the labour market?
- *Get details for £50 thank you incentive (FOR UNIVERSITIES THIS WILL BE £50 TO A CHARITY OF THEIR CHOICE)*
- *Thank and close.*

Appendix G: Inclusion/exclusion criteria for job vacancies analysis

We developed the search string below to identify job postings for AI job roles on the Burning Glass Technologies database, after following the process laid out in Chapter 6. The first part of the string, presented in **black text**, specifies the *included* search terms across the job postings search. The second part of the string, presented in **red text**, specifies the *excluded* terms across job postings search. Please note, this search consciously includes partially spelled words and, in some cases, spelling errors. This reflects common spelling errors across these job postings.

Custom range (Jan. 1, 2020 - Dec. 31, 2020) AND UK-wide AND (Keyword(s) : Artificial Intelligence OR Keyword(s) : AI OR Keyword(s) : Neural Network OR Keyword(s) : Neural Networks OR Keyword(s) : Data Mining OR Keyword(s) : Deep Learning OR Keyword(s) : Machine Learning OR Keyword(s) : ML OR Keyword(s) : Algorithm OR Keyword(s) : Natural Language Processing OR Keyword(s) : NLP OR Keyword(s) : Machine Vision OR Keyword(s) : Turing Test OR Keyword(s) : Supervised Learning OR Keyword(s) : Unsupervised Learning OR Keyword(s) : Cognitive Computing OR Keyword(s) : Text Mining OR Keyword(s) : Predictive Analytics OR Keyword(s) : Augmented Intelligence OR Keyword(s) : Data Science) AND (BGT0CC⁷ : Software Developer / Engineer OR BGT0CC : Data Scientist OR BGT0CC : Data / Data Mining Analyst OR BGT0CC : Computer Systems Engineer / Architect OR BGT0CC : Researcher / Research Associate OR BGT0CC : Web Developer OR BGT0CC : Project Manager OR BGT0CC : Data Engineer OR BGT0CC : Computer Programmer OR BGT0CC : University Lecturer OR BGT0CC : Systems Analyst OR BGT0CC : Medical Scientist OR BGT0CC : IT Project Manager OR BGT0CC : Business / Management Analyst OR BGT0CC : Financial Manager OR BGT0CC : Database Administrator OR BGT0CC : Computer Support Specialist OR BGT0CC : Mechanical Engineer OR BGT0CC : Engineering Manager OR BGT0CC : Civil Engineer OR BGT0CC : Financial Analyst OR BGT0CC : Electrical Engineer OR BGT0CC : Validation Engineer OR BGT0CC : Data Warehousing Specialist OR BGT0CC : Software QA Engineer / Tester OR BGT0CC : Industrial Engineer OR BGT0CC : Market Research Analyst OR BGT0CC : Information Security Engineer / Analyst OR BGT0CC : Database Architect OR BGT0CC : Operations Manager OR BGT0CC : Chief Information Officer / Director of Information Technology OR BGT0CC : Operations Analyst OR BGT0CC : Search Engine Optimisation Specialist OR BGT0CC : Auditor OR BGT0CC : Lawyer OR BGT0CC : Chief Executive Officer OR BGT0CC : Business Intelligence Architect / Developer OR BGT0CC : Computer Scientist OR BGT0CC : Business Intelligence Analyst OR BGT0CC : UI / UX Designer OR BGT0CC : Logistics / Supply Chain Analyst OR BGT0CC : Hardware Engineer OR BGT0CC : Product Development Engineer OR BGT0CC : Biostatistician OR BGT0CC : Electronics Engineer OR BGT0CC : Actuary OR BGT0CC : Architect OR BGT0CC : Network Engineer / Architect OR BGT0CC : Electrical / Electronic Engineering Technician OR BGT0CC : Financial Quantitative Analyst OR BGT0CC : Credit Analyst / Authoriser OR BGT0CC : Chemical / Process Engineer OR BGT0CC : Robotics Engineer OR BGT0CC : Mobile Applications Developer OR BGT0CC : Network / Systems Administrator OR BGT0CC : RF Engineer OR BGT0CC : Technology Consultant OR BGT0CC : Mechatronics Engineer OR BGT0CC : Statistician OR BGT0CC : Security / Defence Intelligence Analyst OR BGT0CC : Microbiologist OR BGT0CC : Risk Manager / Analyst OR BGT0CC : Biologist OR BGT0CC : Engineering Technologist OR BGT0CC : Technical Writer OR BGT0CC : Network / Systems Support Specialist OR BGT0CC : Mathematician OR BGT0CC : Economist OR BGT0CC : Securities / Commodities Trader) AND NOT (BGT0CC : Office / Administrative Assistant OR Title with : Sales Advisor OR Title with : Business Development Executive OR Title with : Accounts Manager OR Title with

⁷ Burning Glass Technologies Occupational Classification Code

: Sales Executive OR Title with : Sales Representative OR Title with : Recruiting Consultant OR Title with : Registered Nurse OR Title with : Maintenance Engineer OR Title with : Staff Nurse OR Title with : Nurse OR Title with : Chef OR Title with : Personal Care Assistant OR Title with : Sales Manager OR Title with : Accountant OR Title with : Risk Manager OR Title with : Teaching Assistant OR Title with : CNC Operator OR Title with : Product Designer OR Title with : Product Manager OR Title with : Sales Specialist OR Title with : Cleaner OR Title with : Shop Volunteer OR Title with : Human Resources Advisor OR Title with : Shop Volunteer - Shop OR Title with : Sales Consultant OR Title with : Receptionist OR Title with : Retail Advisor OR Title with : Sales Associate OR Title with : Apprentice Administrator OR Title with : Account Executive OR Title with : Meter Reader OR Title with : Quantity Surveyor OR Title with : Personal Assistant OR Title with : Sales Development Representative OR Title with : Clinical Manager OR Title with : Human Resources Manager OR Title with : Account Director OR Title with : Director Of Sales OR Title with : Physiotherapist OR Title with : Primary School Teacher OR Title with : CNC Programmer OR Title with : Manufacturing Engineer OR Title with : Energy Advisor OR Title with : Production Worker OR Title with : Administrative Clerk OR Title with : Activity Leadership Apprentice OR Title with : Product Owner OR Title with : Clinical Psychologist OR Title with : Director of Finance OR Title with : Licenced Surveyor OR Title with : Maintenance Technician OR Title with : Administrative Assistant OR Title with : Tax Manager OR Title with : CNC Machinist OR Title with : Contract Manager OR Title with : Office Manager OR Title with : Legal Counsel OR Title with : Social Worker OR Title with : Area Sales Manager OR Title with : Procurement Manager OR Title with : Auxiliary Nurse OR Title with : Occupational Therapist OR Title with : Team Leader - Care OR Title with : Housekeeper OR Title with : Machine Operator OR Title with : Product Marketing Manager OR Title with : Customer Service Advisor OR Title with : Finance Controller OR Title with : Kitchen Porter OR Title with : Recruiter OR Title with : Executive Assistant OR Title with : Safety Engineer OR Title with : Audit Manager OR Title with : Support Worker OR Title with : Internal Audit Manager OR Title with : Radiographer OR Title with : Structural Engineer OR Title with : Care Home Deputy Manager OR Title with : Customer Success Manager OR Title with : Training Manager OR Title with : Copywriter OR Title with : Director of Marketing OR Title with : Maths Teacher OR Title with : Recruitment Manager OR Title with : Business Development Director OR Title with : Portfolio Manager OR Title with : Human Resources Administrator OR Title with : Sales OR Title with : Retail OR Title with : Customer OR Title with : Teacher OR Title with : Buyer OR Title with : Planner OR Title with : Psychologist OR Title with : Test Centre OR Title with : Driver OR Title with : Library OR Title with : Plumbing OR Title with : Human Resources OR Title with : HR OR Title with : Work Home)

Our standards and accreditations

Ipsos MORI's standards and accreditations provide our clients with the peace of mind that they can always depend on us to deliver reliable, sustainable findings. Our focus on quality and continuous improvement means we have embedded a "right first time" approach throughout our organisation.



ISO 20252

This is the international market research specific standard that supersedes BS 7911/MRQSA and incorporates IQCS (Interviewer Quality Control Scheme). It covers the five stages of a Market Research project. Ipsos MORI was the first company in the world to gain this accreditation.



Market Research Society (MRS) Company Partnership

By being an MRS Company Partner, Ipsos MORI endorses and supports the core MRS brand values of professionalism, research excellence and business effectiveness, and commits to comply with the MRS Code of Conduct throughout the organisation. We were the first company to sign up to the requirements and self-regulation of the MRS Code. More than 350 companies have followed our lead.



ISO 9001

This is the international general company standard with a focus on continual improvement through quality management systems. In 1994, we became one of the early adopters of the ISO 9001 business standard.



ISO 27001

This is the international standard for information security, designed to ensure the selection of adequate and proportionate security controls. Ipsos MORI was the first research company in the UK to be awarded this in August 2008.



The UK General Data Protection Regulation (GDPR) and the UK Data Protection Act (DPA) 2018

Ipsos MORI is required to comply with GDPR and the UK DPA. It covers the processing of personal data and the protection of privacy.



HMG Cyber Essentials

This is a government-backed scheme and a key deliverable of the UK's National Cyber Security Programme. Ipsos MORI was assessment-validated for Cyber Essentials certification in 2016. Cyber Essentials defines a set of controls which, when properly implemented, provide organisations with basic protection from the most prevalent forms of threat coming from the internet.



Fair Data

Ipsos MORI is signed up as a "Fair Data" company, agreeing to adhere to 10 core principles. The principles support and complement other standards such as ISOs, and the requirements of Data Protection legislation.

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