e-skills uk

Big Data Analytics

Adoption and Employment Trends, 2012-2017

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November 2013
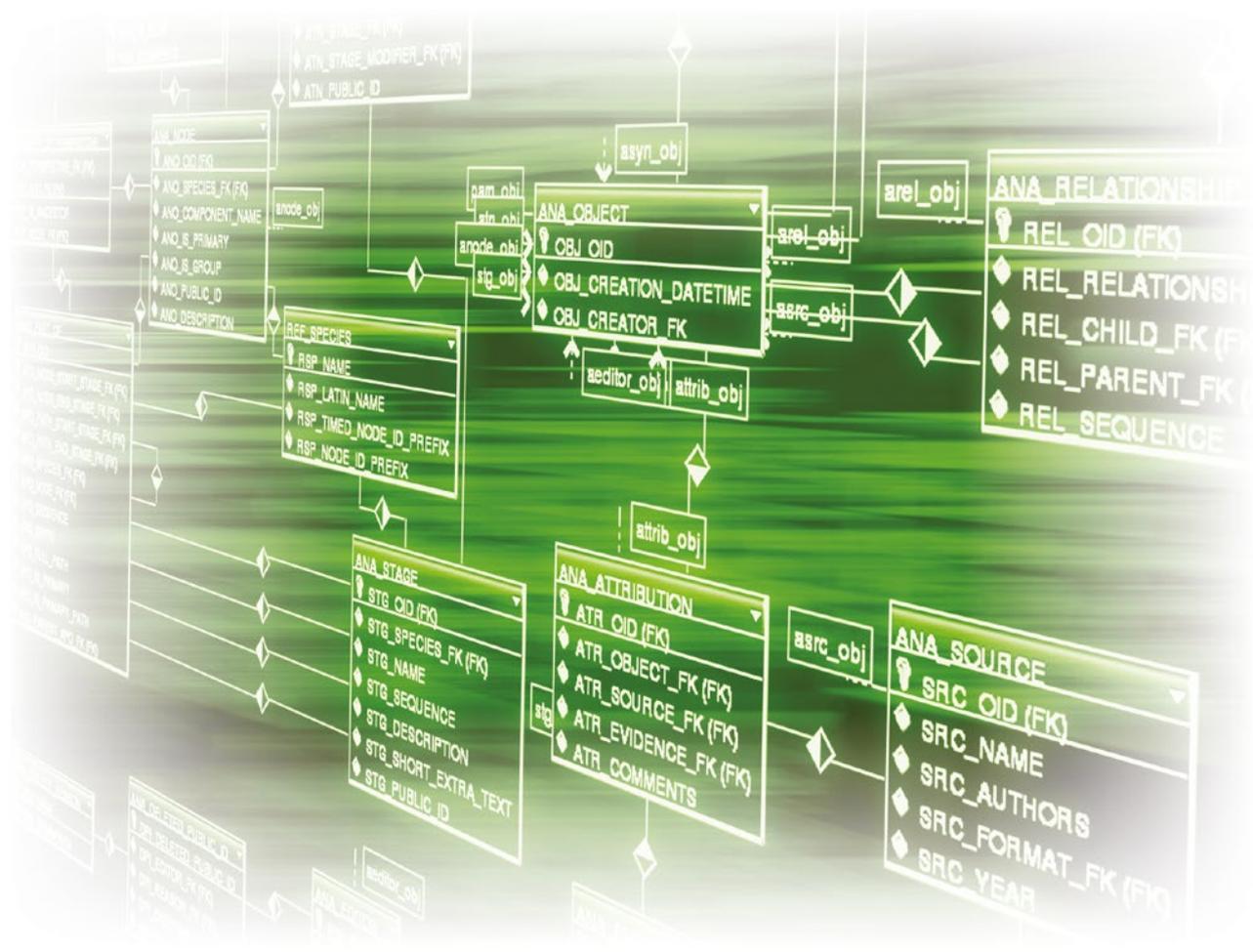
About e-skills UK

e-skills UK is the Sector Skills Council for Business and Information Technology working on behalf of employers to develop the software, internet, computer gaming, IT services and business change expertise necessary to thrive in today's global digital economy. Focused on making the biggest contribution to enterprise, jobs and growth across the economy, e-skills UK's three strategic objectives are to: inspire future talent, support IT professionals and increase digital capability. Delivery on these strategic objectives is underpinned by employer engagement across the sector, authoritative research, a continually developing sector qualifications and learning strategy, and effective strategic partnerships.

About SAS

SAS is the leader in business analytics software and services, and the largest independent vendor in the business intelligence market. Through innovative solutions, SAS helps customers at more than 65,000 sites improve performance and deliver value by making better decisions faster. Since 1976 SAS has been giving customers around the world THE POWER TO KNOW®.

About our partners:

IT Jobs Watch provides a concise and accurate map of prevailing trends in demand for IT staff within the UK. This is achieved by collating and analysing related vacancy statistics sourced from leading IT recruitment websites, and presenting the associated results in a freely available, fully searchable web application, which is updated on a daily basis to ensure users have access to the very latest information. Our services are employed by a variety of clients including job seekers, careers specialists, recruitment agencies and employers who use either our standard and/or bespoke services to, for example, measure demand for specific skills or specialisms, identify the skills needed by specific IT jobs, and assess remuneration levels for IT positions. For further information, please visit us at: www.itjobswatch.co.uk.

Experian has an Economics Group of more than 40 economists and consultants who specialise in global macroeconomic, regional and local area forecasting. We have more than 20 years' experience in economic forecasting, and in recent years have been consistently ranked above our peers in terms of forecasting accuracy by associated Sunday Times' polls. We provide a suite of subscription products, bespoke consulting services and seminars for clients across a broad range of sectors in a growing number of countries. Our core expertise extends to a number of key sectors, including retail, property, financial services, public sector and IT. For further information, please visit us at: www.experian.co.uk/economics.

Foreword

This report has been produced by e-skills UK on behalf of SAS UK & Ireland. It is the second in a dedicated series looking at the current/forecast uptake of big data analytics and the associated demand/supply for related labour and skills amongst UK employers.

In the first report of the series (published in January of this year), we provided a detailed analysis of advertised demand for big data specialists over the past five years using bespoke data from IT Jobs Watch. Using this analysis, in conjunction with econometric forecasts provided by Experian, we then set out three possible scenarios for related demand trends over the coming five years.

In this report, we have sought to strengthen our knowledge in this area by providing baseline estimates for big data adoption and employment based upon the findings of two bespoke surveys conducted amongst a) SMEs (Small and Medium Sized Enterprises) and b) larger firms (those with 100 or more staff) operating within the UK.

Though the findings presented within this report should be considered as being the views of e-skills UK alone, we would like to offer our thanks to those organisations involved with the project, namely: IT Jobs Watch, who continue to support us via the provision of dedicated demand data; Experian, who provided input by way of forecasting expertise; and, of course, SAS UK & Ireland who continue to sponsor, what we consider to be, groundbreaking research in this field.

Aside from sponsors and partners, we would also like to thank those businesses contacted in the course of the survey work undertaken for this report, notably the 1,000+ firms that worked through the full survey questionnaires with us, but also those contacted during the initial screening process.

Lastly, thanks to all those who have responded to our ad hoc queries for background information about big data analytics and related developments in the UK.
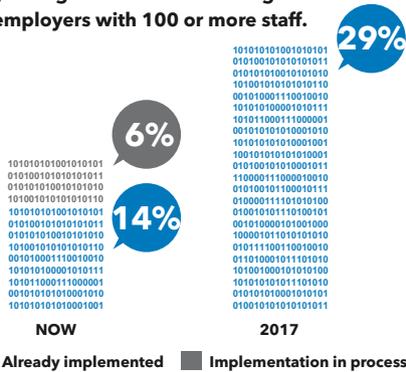
The Big Data Analytics Landscape

A growing discipline but a skills gap is emerging

The Skills Gap

IMPLEMENTATION

Implementation of big data analytics is growing and will continue to grow in employers with 100 or more staff.

29%

6%

14%

NOW | 2017

■ Already implemented ■ Implementation in process

6,400 organisations with 100 staff or more

will have implemented big data analytics by 2018.

Larger organisations are more likely to implement big data analytics.

10%

13%

8%

3%

25%

20%

17%

9%

100 - 249 | 150 - 499 | 500 - 999 | 1000+

Number of Staff

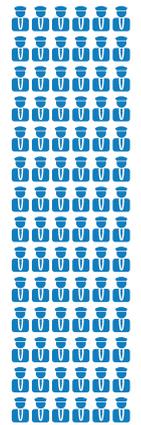■ Already implemented ■ Implementation in process

BUSINESS BENEFITS

90% of larger firms said major or minor business benefits could be obtained if the skills of specialists/ user staff could be increased.

SKILLS TRAINING

45% of firms seeing benefits from upskilling foresee problems finding associated training.

57% of big data recruiters say it is difficult to find people with the required skills and experience, ie. it is not all firms, just those recruiting big data staff.

BIG DATA OPPORTUNITIES

Today big data analytics offer organisations similar opportunities: to create insights, delight customers and increase revenue. But specialist skills are required to make the most of this opportunity.

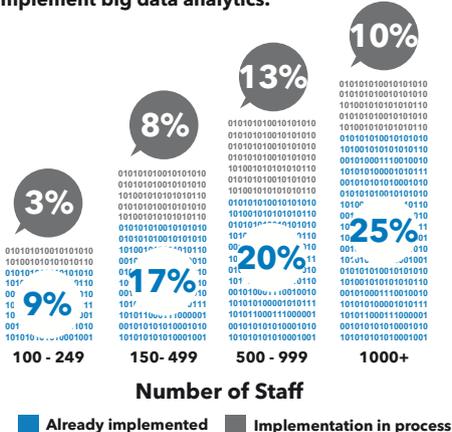**243%** increase in big data specialists

2012 | 2017
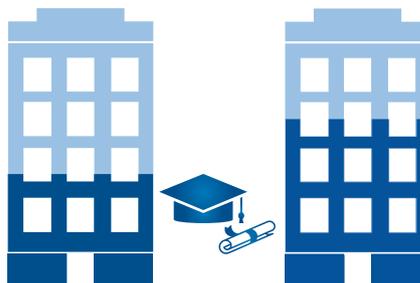
LIFE WITHOUT PILOTS

In the early 1900s, the Wright brothers invented the airplane. It offered great opportunities to travel …

… to places and discover new countries. But there was a skills gap because there were no pilots.
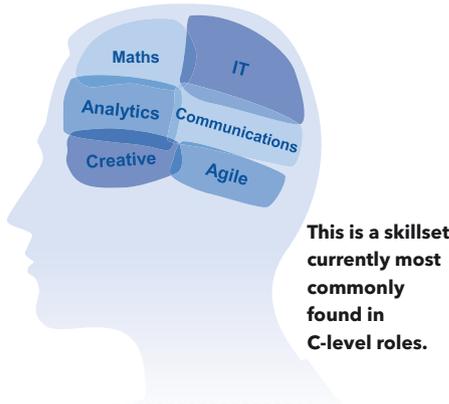
Partnership is required to solve the skills gap

How SAS is helping

We're helping taking action on skills

SKILLS

A unique skill set is required to make the most of the opportunity offered by Big data analytics.

Maths

IT

Analytics

Communications

Creative

Agile

This is a skillset currently most commonly found in C-level roles.

PARTNERSHIP

Government, Academia and Business need to work together to solve this skills gap.

§sas

RESEARCH

The e-skills UK study represents the largest study of the uptake of big data analytics ever undertaken in the UK.

e-Skills UK is the Sector Skills Council for Business and Information Technology.

SAS recognises that we have a part to play in filling the skills gap. We believe that by investing in the future we can help organisations make the most of the opportunities that big data analytics offer.

UNIVERSITIES

1

£6m of software

Annually we offer over £6m of software and materials to UK and Ireland universities.

2

Over 2,500 university students receive training in SAS products, helping them to be ready for the jobs of the future.

3

Over 50 PhD and MSc programmes are supported by SAS.

SCHOOLS

1

SAS Curriculum Pathways offer free online tools to teach maths and science in schools.

2

Visual Analytics – using a database relating to the Titanic disaster, we provide a visual SAS tool to support the GCSE Computing curriculum.

FLAGSHIP UNIVERSITIES

Lancaster

Manchester

Birmingham City

Warwick Business School

Southampton

University College London

SAS STUDENT ACADEMIES

A group of 16 universities teaching SAS on computer courses.

sas student academy.

With a generous provision of software, teaching materials and advice, and access to blue-chip SAS customers, the SAS Student Academy will give students what they need to succeed in an increasingly data-driven world.

Professor Melvyn Lees, Executive Dean at Birmingham City University

Contents

Executive summary

Methodology

- The results of this study are based on the largest study of the uptake of big data analytics ever undertaken in the UK.

- Data was collected from over 1,000 organisations in total – 541 SMEs via an existing Omnibus survey, and more than 500 larger firms (with 100 or more staff) by way of a dedicated telephone survey.

- In each case, the appropriate respondent was identified via self-selection and, in the vast majority of cases, held a directorial/senior level position and, amongst larger firms, a role of this nature within the IT function.

Findings

- The levels of understanding of big data analytics is often low, both within the SME community and amongst larger employers where more than one in five (22 per cent) respondents said they had either 'poor' or 'very poor' knowledge of related concepts and technologies.

- Adoption rates for big data analytics amongst the SME community is extremely low: of the 541 SMEs contacted as part of this study, none had implemented big data analytics at the time of questioning. As such, the proportion of SMEs that has implemented big data analytics is likely to be less than 0.2 per cent (i.e. less than 1 in 541).

- Adoption rates were found to be much higher amongst larger businesses and increased from 9 per cent for firms with 100–249 employees to 25 per cent for those employing 1,000 or more. In total, though, fewer than one in seven (14 per cent) of firms with 100+ employees in the UK were found to have implemented big data.

- The main reason given for big data implementation was to cope with large volumes of data – cited by nine in ten (90 per cent) larger employers.

- The IT function, more than any other, was found to hold either sole or joint responsibility for big data activities within larger UK enterprises – this being the case for 31 per cent and 9 per cent respectively of those that had adopted big data analytics.

- In total, there are estimated to be approximately 31,000 employees within large organisations working on big data analytics, of whom 32 per cent are employed in IT-focused roles and 57 per cent in data-focused positions.

- As noted within our previous report, Data Scientists, whilst being the focus of much media attention, are thought to account for only a small proportion of big data employment as a whole (i.e. 3 per cent or 1,000 people within large organisations).

- On average, there are thought to be in the region of 94 core, big data users per organisation that had implemented big data, equating to a total user base within the UK (amongst large organisations) of approximately 383,000 people.

- Though (or more possibly because) big data analytics is a relatively new business activity, large organisations are already suffering from the related skills gaps amongst both their specialist and user staff, as 90 per cent of respondents from larger firms stated that major or minor business benefits could be obtained if the skills of these staff could be increased (61 per cent in the case of big data specialists and 87 per cent when considering user staff).

- In both cases, the overriding issue for such employers would appear to be the level of data-related skills held by such employees (as opposed to IT/ other skills).

- Though recruitment is a common means of addressing skills gaps of this nature, only 24 per cent of larger employers in the UK stated that they had taken on staff for big data positions over the past year.

- An update of the figures outlined within our report earlier this year (*Big Data Analytics: An assessment of demand for labour and skills, 2012-2017*) shows the main skills required for big data positions over the past year were as follows:

IT processes/methodologies
- Agile Development
- TDD
- OO
- Scrum
- SOA

Specific IT applications/Tech/vendors
- Oracle
- Java
- SQL
- Linux
- JavaScript

Data-related processes/methodologies
- Business Intelligence
- NoSQL
- Data Warehouse
- Big Data
- ETL

Specific data-related applications/tech/vendors
- Oracle BI EE
- MongoDB
- MySQL
- Hadoop
- Informatica

- Amongst those recruiting big data specialists in the past year, just under three out of every five (57 per cent) stated that they had found it difficult/ very difficult to find people with the required skills, qualifications or experience needed.

- Between 2012 and 2017, the uptake of big data analytics amongst larger enterprises in the UK is anticipated to more than double from 14 per cent to 29 per cent of firms employing 100 or more staff.

- The number of specialist big data staff working in larger firms in the UK is forecast to increase by 243 per cent over the next 5 years to approximately 69,000 people.

- Though proportionately, growth in the number of big data users is likely to be lower (177 per cent over the next 5 years), in volume terms user numbers will rise much more dramatically to around 644,000.

1   Introduction and methodology

1.1   Introduction and background to the study

In recognition of the lack of UK-specific data relating to big data analytics adoption and related employment trends, SAS UK & Ireland has commissioned e-skills UK to undertake a dedicated programme of research to investigate these issues in detail.

The first element of the associated work programme was an analysis of secondary demand data (provided by IT Jobs Watch) which sought to provide a definitive overview of the key occupations and skills required by UK employers implementing big data analytics. The results of this exercise were published in a dedicated report earlier this year, which also featured a series of related demand forecasts (generated in association with Experian) for the coming 5-year period.

In the process of undertaking this work, a number of issues were raised concerning the baseline data upon which UK-specific estimates/forecasts could be generated, not least the absence of any major quantitative studies in this area.

Accordingly, in this, our second study of big data analytics in the UK, we have sought to address this issue by way of two dedicated surveys of employers covering both SMEs and larger businesses operating within the UK.

1.2   Methodology

To give more control over the sampling methodology/respondent base and to ensure quality of response data, it was decided that telephone interviewing would be used to collect the required data from employers (i.e. as opposed to a web survey/poll). More specifically, data collection was undertaken by way of two separate but inter-related employer surveys providing full coverage of the UK business population:

i)   To cover the SME sector (firms with up to 249 employees) we fielded a series of questions within an established SME survey (the IFF SME Omnibus) and boosted the survey sample to provide coverage of public sector employers (excluded in the regular survey process).

ii) For larger organisations (those with 100 or more employees[i]) we commissioned a dedicated telephone survey from Experian, again covering all sectors and with quotas applied for size and nature of business activity.

On completion of each survey, response data was cleaned and weighted to the UK business population using estimates from the Office for National Statistics (i.e. the ONS Interdepartmental Business Register or IDBR).

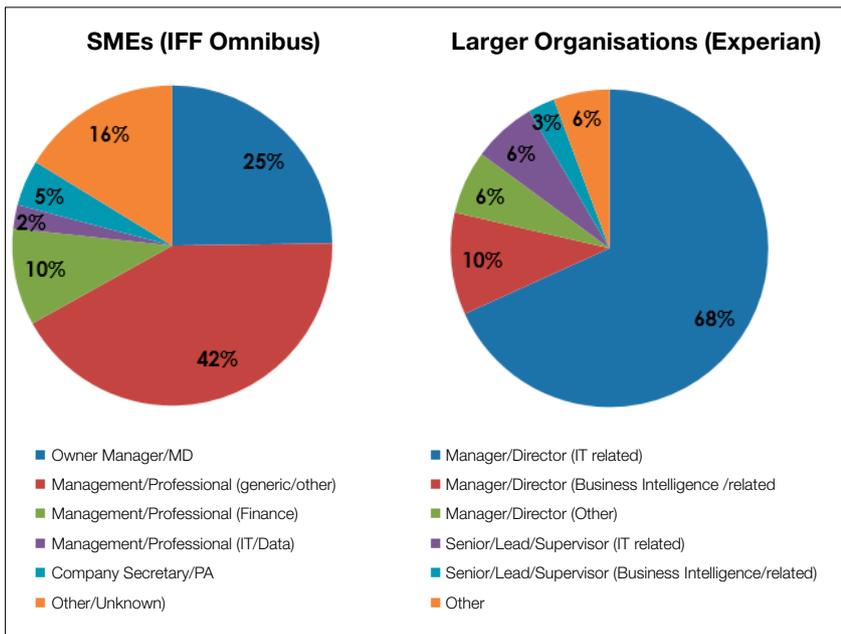This report draws on responses from two dedicated surveys of UK businesses

1.3 Response base and respondent details

In total, we collected information from over 1,200 businesses during the course of the survey, and obtained detailed responses pertaining to big data analytics from just under 1,100 (541 via the IFF Omnibus and 510 via the Experian survey of larger employers). In the vast majority of cases, the individual responding to the survey held a senior position within the company – typically director/owner for SMEs and head/director of IT within larger organisations:

In total, more than 1,200 businesses were contacted in the course of this study

Figure 1: Breakdown of survey respondents

SMEs (IFF Omnibus)

- 25%
- 42%
- 16%
- 5%
- 2%
- 10%

Larger Organisations (Experian)

- 68%
- 10%
- 6%
- 6%
- 3%
- 6%

■ Owner Manager/MD
■ Management/Professional (generic/other)
■ Management/Professional (Finance)
■ Management/Professional (IT/Data)
■ Company Secretary/PA
■ Other/Unknown)

■ Manager/Director (IT related)
■ Manager/Director (Business Intelligence /related
■ Manager/Director (Other)
■ Senior/Lead/Supervisor (IT related)
■ Senior/Lead/Supervisor (Business Intelligence/related)
■ Other

Source: e-skills UK

2 Knowledge/understanding of big data analytics

2.1 SMEs

Though initially, SMEs were not explicitly asked about their levels of knowledge/ understanding of big data analytics, the result obtained from the omnibus survey provided some very strong indications in this area, i.e. after the initial interviews were undertaken, an extremely high figure for big data adoption led us to question whether interviewees has really understood the terminologies employed. As a result, we re-contacted all those stating they had implemented big data analytics and undertook some further investigative research around their knowledge/perceptions of this specialism and related plans/actions.

As a result of this work it quickly became apparent that, in general, respondents from the SME community had little, if any, knowledge of big data analytics, and that very few were likely to have implemented/be in the process of implementing such technologies/processes within their business.
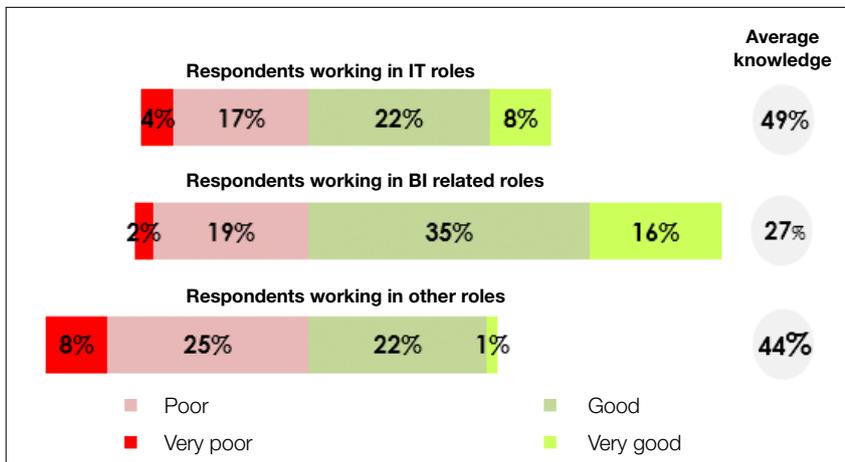
Levels of knowledge/ understanding of big data analytics is particularly low amongst SMEs

2.2 Larger organisations

As perhaps would be expected, respondents from larger organisations appeared (by their own account) much better informed about big data analytics than their SME counterparts. This said, a significant proportion of respondents from such organisations (22 per cent) were still of the view that their knowledge in this area was either poor or very poor – moreover, low levels of knowledge/ understanding were common amongst senior staff working in both IT and BI (Business Intelligence) roles.

One in five respondents from larger firms were poorly/ very poorly informed about big data analytics

Figure 2: Knowledge/understanding of big data analytics amongst larger firms

Source: e-skills UK

Low levels of knowledge/understanding appear to be more prevalent amongst organisations operating in the primary sector (extractive, production and construction), those with less than 500 employees, and those that have not implemented or do not intend to implement big data analytics (though these characteristics are also linked, as illustrated within the following sections).

3 Adoption patterns for big data analytics

3.1 SMEs

Of the 541 SMEs contacted in the course of the Omnibus study, we found none to have implemented big data analytics. This is not to say that there are no SMEs in the UK running with this technology, however, just that the proportion doing so would appear to be extremely low (i.e. less than 1 in 541 or 0.2 per cent, as a general rule of thumb).

This observation was supported by the results of our survey of larger employers which showed that approximately 9 per cent of firms employing between 100 and 249 staff (technically part of the SMEs sector) had implemented big data analytics – i.e. around 1,100 firms or 0.1 per cent of the 2.1m SMEs thought to be operating in the UK (according to latest estimates from the Office for National Statistics).

3.2 Larger organisations

Overall, we estimate that around one in seven (14 per cent) organisations in the UK with 100 or more staff (larger firms) have already implemented big data analytics and around one in 20 (7 per cent) are in the process of implementing at this point in time – equating to around 4,600 businesses in total that will have implemented by the end of 2013.

Figure 3: Big data implementation patterns for firms with 100 or more staff

Source: e-skills UK

As illustrated in the chart above, the likelihood of businesses having implemented big data analytics appears to relate strongly to firm size, ranging from just under one in 10 (9 per cent) firms with 100–249 staff, to one in four (25 per cent) of those with 1,000 or more employees.

An analysis of implementation figures by sector shows IT&T firms significantly more likely to have implemented big data analytics than other organisations in the UK (i.e. for comparison, figures of 24 per cent and 13 per cent respectively).

The proportion of SMEs working with big data is minimal

Just over one in five larger employers have implemented/ are implementing big data analytics

Adoption of big data analytics correlates with company size

Amongst the other broad sectors for which data are available, however, (i.e. primary/manufacturing, public sector and other services), there was very little difference in associated rates of adoption (i.e. 14 per cent, 14 per cent and 12 per cent respectively).

3.3 Main drivers for implementing big data analytics

The primary motivator for larger firms adopting big data analytics (from this point on all data presented is with respect to those that have adopted big data unless otherwise stated) was to contend with large volumes of data – this reason was cited by nine in 10 (90 per cent) of those that had already implemented. Data variation (i.e. dealing with combinations of structured and unstructured data) was cited as the reason by just under three-quarters (73 per cent) of big data adopters, whilst a need to cope with unstructured data, in particular, was highlighted by two-thirds (67 per cent) of those that had already implemented related technologies/processes.

Aside from volume and variety, the other 'core' aspect to big data definitions is data velocity (the need to manage rapidly changing data feeds) and though, by comparison this appears to be a relatively uncommon motivator for the adoption of big data analytics by large employers, it was still given as a reason for implementation by more than half (57 per cent) of those that had introduced big data analytics to their business.

3.4 Location of big data activity

Despite the prevalence of IT/other off-shoring, the vast majority (81 per cent) of big data work undertaken by larger organisations in the UK is thought to be conducted in-house and onshore. This finding is still more pronounced when considering data-focused activity, of which less than 10 per cent is thought to be undertaken externally or by overseas branches of the parent company.

Figure 4: Estimated distribution of big data activities
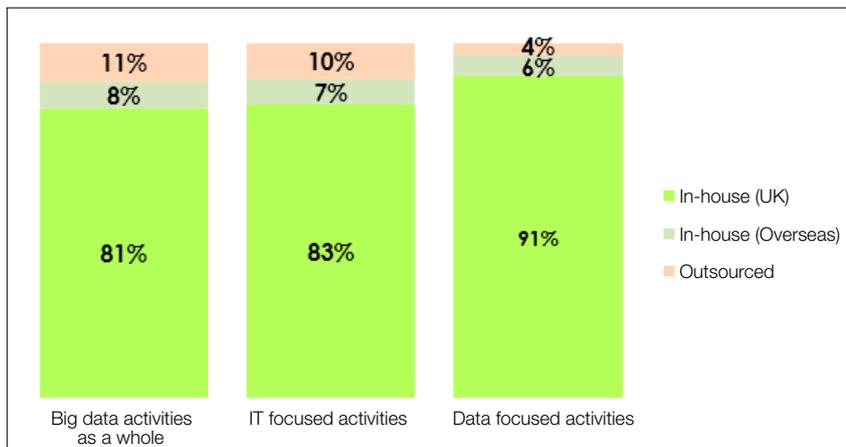
Source: e-skills UK

IT&T firms are significantly more likely to have adopted big data analytics

Nine in ten big data implementers have done so to contend with increasing data volumes

Big data analytics mostly undertaken in-house and onshore

3.5 Responsibility for big data analytics

Responsibility for big data analytics appears most likely to be sited within the IT function of larger organisations (i.e. in 40 per cent of cases), though leadership is often shared with other business functions (i.e. in 22 per cent of organisations where IT was identified as the lead it was in tandem with another department).

After IT, the finance department was the next most likely to hold responsibility for big data activity (i.e. in 24 per cent of firms that had implemented), followed by a dedicated data/MIS/BI or related function which was found to be the lead department for one in 10 organisations (12 per cent) surveyed.

Figure 5: Lead department for big data activity

Source: e-skills UK

Overall responsibility for big data analytics most often resides with the IT function
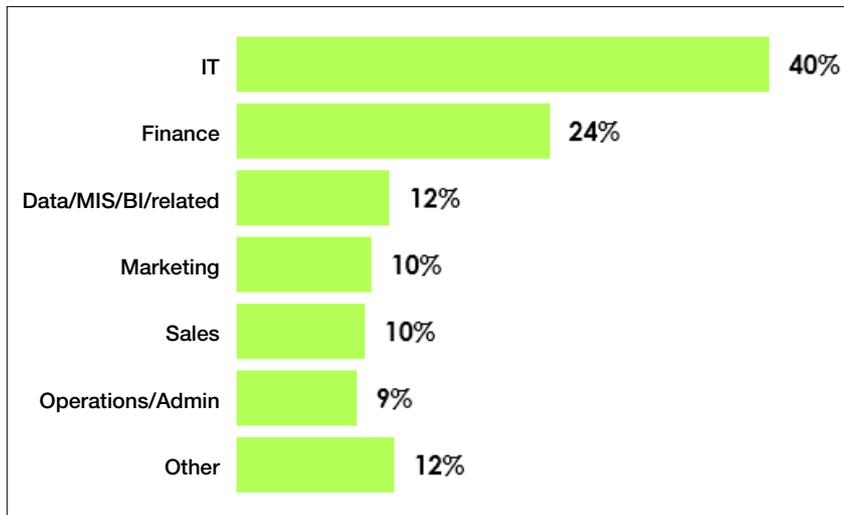
3.6 Tools and technologies employed

When asked about suppliers and associated technology employed for big data analytics (and, in particular, related storage/management/visualisation activities), respondents to the survey most commonly cited names from a list of more established/well-known vendors/technologies (e.g. MS/SQL Server, IBM/Cognos, SAP/Business Objects, SAS and Oracle) as opposed to those perhaps considered as being newer/niche (i.e. Hadoop/NoSQL and specialist suppliers).

Users of big data analytics tend to favour larger/ well-established technologies/suppliers

4 Big data employment levels

4.1 Employment of big data specialists by function and role

In total, there are estimated to be approximately 31,000 people working in specialist big data roles within larger organisations in the UK. Of these, just under one-third (10,000) is thought to be employed in specialist IT positions[ii], more than half (17,000) hold data-focused positions and around one in 10 (11 per cent) are employed in other roles. Table 1 below provides a further breakdown of employment by sub-role.

Larger UK employers employ around 31,000 specialists to work on big data analytics

Table 1: Big data employment by broad/detailed role group

Big data employment	31,000
of which	
IT-focused roles:	**10,000**
Strategy/planning/design	2,000
Development/implementation	3,000
Administration/operations	1,000
Support	1,000
Other IT-focused	2,000
Data-focused roles:	**17,000**
Data Engineers	3,000
Data Administrators	1,000
Data Analysts	8,000
Data Scientists	1,000
Other data-focused	4,000
Other roles	**4,000**

Source: e-skills UK

As noted within our report on the demand for big data skills published earlier in the year, it is interesting to note that, whilst the subject of much media attention of late, Data Scientists still account for a relatively small proportion of big data employment within larger UK organisations (i.e. around 3 per cent).

4.2 Employment of big data users

In total there are thought to be around 383,000 big data users working in larger organisations in the UK i.e. those using company-specific user tools/outputs in their main job (i.e. dashboards/KPI data/market analysis as opposed to built in, third-party tools, like Google search for example).

*There are approximately 383,000 big data users working with larger employers in the UK*

5 Big data skills in the workplace

5.1 Skills matching

Given that big data analytics is a relatively new phenomenon within the business community, facilitated by developments in hardware deployment and related software systems, it is perhaps unsurprising to learn that reports of related skills gaps are commonplace amongst big data adopters.

In fact, nine out of 10 companies (90 per cent) that had implemented big data analytics stated that improving the skills of their big data specialists and/or users would have either a minor or major impact on the company's ability to set up, run and benefit from big data analytics. Moreover, of these, the majority (63 per cent) thought that the impact would be of a major proportion.

Figure 6: Likely impact of up-skilling big data analytics staff
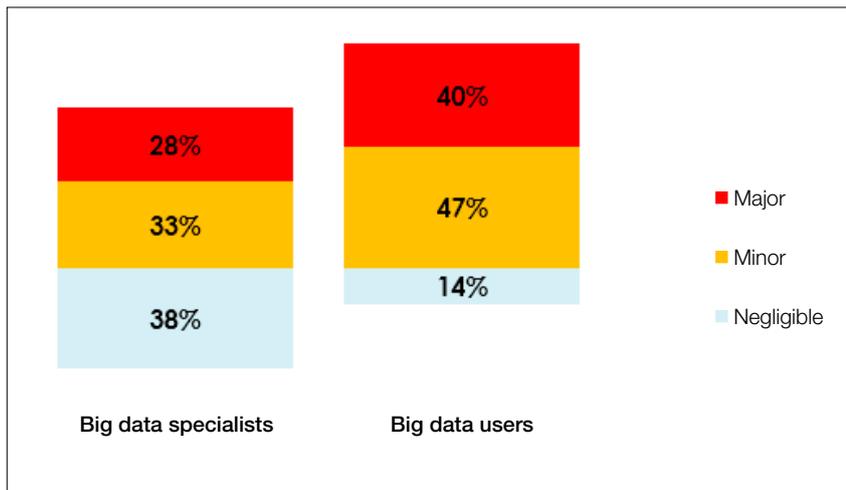
Source: e-skills UK

As illustrated in the chart above, the main potential for generating related business benefits from up-skilling big data analytics staff appears to lie with developing the skills of the big data user base, perhaps due to the sheer number of staff involved, or perhaps through the knock-on effect that skills improvements could generate (i.e. improved planning, market segmentation, etc.). Irrespective of the type of big data staff in question, though, the areas in which up-skilling activities were thought most likely to generate the biggest business benefits were data/analytics and, to a lesser extent, IT skills development.

Nine in ten big data adopters see potential gains from up-skilling big data staff

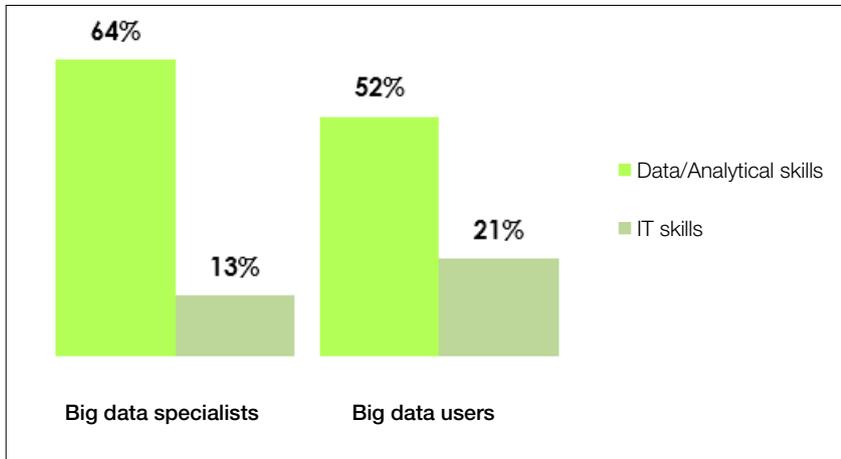**Data/analytics skills improvement seen as the main generator of business benefits**

Figure 7: Up-skilling likely to give the largest benefits

Source: e-skills UK

5.2 Training implications

Though data/analytics skills development appears to be a key training consideration for big data adopters, many are potentially hampered in their ability to realise these benefits due to a lack of appropriate training courses. In fact, more than four in 10 organisations (45 per cent) that associated this kind of training with minor/major business benefit stated that they would be likely to have difficulty sourcing training of this nature.

Moreover, it is not just data/analytics training that is potentially difficult to source, as a similar proportion of firms stated this also to be the case for related IT training (i.e. 43 per cent of those identifying an increase in IT skills as one of the most likely generators of business benefit via improvements in their ability to set up, run and benefit from big data analytics).

Aside from data/analytics and IT skills, a number of other skills to be addressed amongst big data specialists were identified by respondents to our survey of large employers – the most significant being: knowledge of the company/client operating sector and other business functions (i.e. outside of that in which big data analytics was based).

Difficulties commonplace for firms seeking data/analytics training for big data staff

6   Recruitment of big data staff

Though training is the primary means of combating skills gaps within the workforce, many employers (just over one in 10 according to the UKCES Employer Skills Survey, 2011) will also seek to address such issues by recruiting new staff with the skills/knowledge/experience needed by the business.

6.1   Incidence and nature of big data recruitment

Amongst larger firms that had adopted big data analytics, just under one-quarter (24 per cent) stated that they had recruited specialist big data staff during the previous year (i.e. approximately 700 organisations) with recruitment focused primarily in the following areas:

One in four larger firms running big data analytics recruited specialist staff for related roles last year

Table 2: Main occupations and skills required by big data analytics recruiters

Top five IT-focused roles:	Top five data-focused roles:
• Developer	• Business Intelligence Consultant
• Architect	• Data Architect
• Consultant	• Business Analyst
• Analyst	• Business Intelligence Architect
• Administrator	• Business Intelligence Analyst
Top 10 IT skills demanded: **1 - process/methodological skills**	**Top 10 data-related skills demanded:** **1 - process/methodological skills**
• Agile Software Development	• Business Intelligence
• TDD	• NoSQL
• OO	• Data Warehouse
• Scrum	• big data
• SOA	• ETL
• Continuous Integration	• Analytics
• Unit Testing	• Data Modelling
• BDD	• RDBMS
• Multithreading	• Data Mining
• OOP	• Data Management
2 - applications/technologies/vendors	**2 - applications/technologies/vendors**
• Oracle	• Oracle BI EE
• Java	• MongoDB
• SQL	• MySQL
• Linux	• Hadoop
• JavaScript	• Informatica
• SQL Server	• Amazon EC2
• Python	• Apache Cassandra
• PHP	• Oracle 11g
• UNIX	• PL/SQL
• CSS	• Oracle EBS

Source: e-skills UK analysis of data from IT Jobs Watch (2012)

6.2   Incidence and nature of recruitment difficulties

As illustrated within the previous section, advertised demand for big data staff has increased dramatically in recent years and, as such, it is unsurprising to find that a significant proportion of recruiters (57 per cent) have experienced difficulty filling such positions during the past year (i.e. those stating that such positions were either fairly/very difficult to fill).

The small number of respondents from the survey stating that they had experienced difficulties of this nature prevents us from providing any further quantitative analysis in this area: however, it would appear that the main area in which recruitment difficulties occurred appears to have been with respect to data-, as opposed to IT-focused positions.

A number of qualitative references to recruitment difficulties were collected in the course of the study and, although the results should not be considered as being statistically significant, it is interesting to observe the wide range of skills/experience considered to be in short supply by survey respondents, as shown below.

Table 3: Qualitative references to big data skills shortages

Technical IT skills:	**Specific analytics/big data skills:**
• SAP • SQL Server • MS Access	• Business Intelligence • Analytics • Trend Analysis
Generic skills:	**Related concerns:**
• Employer's industry sector • Data warehousing	• General level of competition for quality candidates

Source: e-skills UK

> More than half of those recruiting big data staff had difficulties filling these positions

7   Future trends

7.1   Future take-up of big data analytics

Whilst 14 per cent of larger employers have already implemented big data analytics and 20 per cent are likely to have done so by the end of the year (i.e. adding in the 6 per cent that are in the process of implementing), the results of our employer survey suggest that adoption rates will grow significantly in the near term and, over the five-year period from 2012–2017, the proportion of larger businesses running big data systems will more than double to around 29 per cent of businesses this size.

Figure 8: Estimated adoption of big data analytics for larger firms, 2012–2017
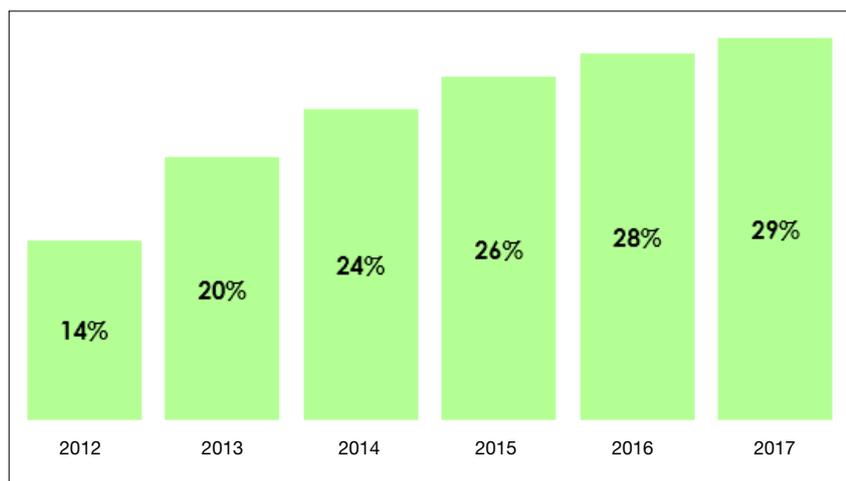
Source: e-skills UK/Experian

7.2   Future employment of big data staff

As the incidence of big data adoption increases, so too will employment levels, not only as a result of the increase in the number of businesses using big data analytics, but also due to planned expansion in the number of specialists and users working within firms that have already implemented.

1)   Employment of big data specialists

As illustrated within the chart overleaf, employment of big data specialists amongst larger firms is anticipated to increase from approximately 20,000 people in 2012 to 69,000 staff in 2017. This would equate to an overall employment increase of around 49,000 people and a growth rate of 243 per cent over the five-year period (i.e. averaging at 49 per cent per annum).

Though it is not possible to present detailed forecasts for specific occupational groups, it appears, from the data we have collected, that growth in big data employment will be strongest for data- as opposed to IT-focused positions.

Adoption of big data analytics amongst larger employers will more than double between 2012 and 2017 Adoption of big data analytics amongst larger employers will more than double between 2012 and 2017
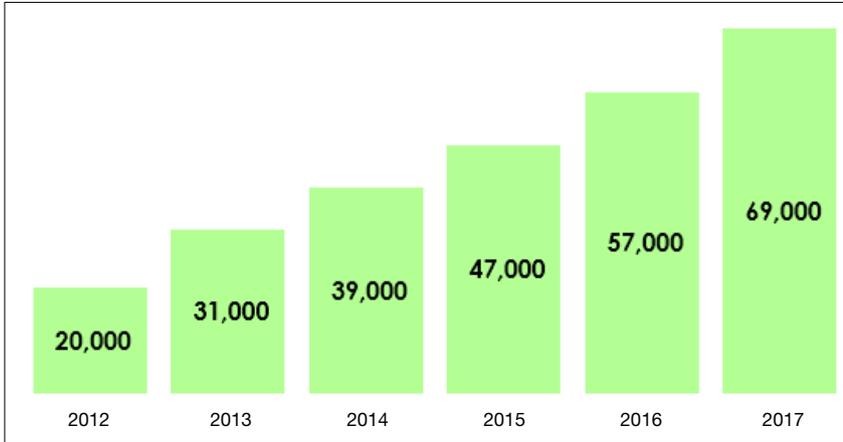
Employment of big data specialists to increase by 243% between 2012 and 2017

Figure 9: Employment of big data specialists in larger firms, 2012–2017

Year	Value
2012	20,000
2013	31,000
2014	39,000
2015	47,000
2016	57,000
2017	69,000

**Employment growth will be particularly high for data-focused positions**

Source: e-skills UK/Experian

2)   Employment of big data users

Over the 2012–2017 period, the number of big data users employed by larger UK firms is anticipated to increase by 177 per cent or 35 per cent per annum, taking the number of user staff from 233,000 in 2012 to around 644,000 in 2017.

Employment of big data users to increase by 177% between 2012 and 2017

Figure 10: Employment of big data users in larger firms, 2012–2017

Year	Value
2012	233,000
2013	382,000
2014	487,000
2015	553,000
2016	604,000
2017	644,000
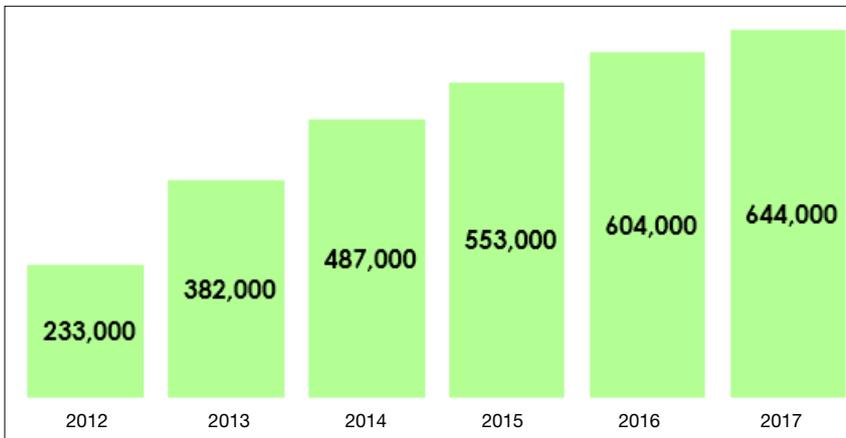
Source: e-skills UK/Experian

End notes

i   In this report, we intentionally make reference to 'larger' as opposed to 'large' businesses as this element of our survey work covered all firms with 100 or more employees as opposed to those with 250 or more, which is the standard (employment) definition of a large company. Standard definitions according to firm size are:

SMEs:

Micro-businesses – those with up to 9 employees

Small businesses – those with 10–49 employees

Medium-sized businesses – those with 50–249 employees

Large firms:

Businesses with 250 or more employees

Our decision to cover firms with 100 or more staff with our bespoke survey was due to the appreciation that a significant proportion of firms with 100–249 staff were likely to have implemented big data analytics and, as such, would be able to provide further, more detailed information about related experiences/activities. By contrast, extending the sampling frame downwards to include those with fewer employees was not considered cost effective due to the very low adoption rates anticipated (and borne out by the study) – hence the decision to cover this section of the economy by way of an existing Omnibus.

ii For the purposes of this survey/report employment within a) IT-focused and b) data-focused roles were differentiated as follows:

IT-focused roles – enabling roles focused on the design, development, implementation, administration, maintenance and support of big data related systems and applications.

Data-focused roles – analytical roles focused on identifying, acquiring, managing, manipulating, analysing, understanding, utilising and presenting big data and related inferences/propositions.

iii Figures presented may not total exactly due to rounding i.e. numerical estimates (e.g. number of big data specialists/users) have been rounded to the nearest 1,000 whilst estimated proportions (e.g. the percentage of firms employing big data analytics) are rounded to the nearest whole number.

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