DATA SKILLS FOR THE FUTURE
POSITIONING THE UK FOR SUCCESS IN A DATA-DRIVEN WORLD

Written by Dr George Windsor, Pearson and Accenture with partners from the Data Skills Taskforce

FOREWORD

RAY EITEL-PORTER,
CHAIR OF THE DATA SKILLS TASKFORCE
AND MANAGING DIRECTOR, ACCENTURE ANALYTICS

The digital revolution is here and if the UK is to become a leader in the digital world, then data skills and know-how have to be at the heart of that mission. Put very simply, without data, there's no digital. In the fast-growing digital economy, data is a vital resource for the use and evolution of the machine-learning and advanced analytics that convert digital data into valuable business and social impacts.

The Data Skills Taskforce[1] was called into being because the UK government recognised the valuable recommendations proposed by the Nesta report, *Analytic Britain*. These recommendations were seen as important contributors to improving digital productivity across the UK economy.

As such, the main aims of the Data Skills Taskforce are to:

- **Act as a knowledge and best practice sharing forum across key participants from industry, higher education, and schools.**

- **Continue to promote the importance of data skills and analytics across those three groups.**

- **Monitor progress against the recommendations of Analytic Britain and highlight critical gaps.**

In my roles as both Chair of the Taskforce and the Lead for Accenture Analytics, UK and Ireland, it's clear to me that industry is increasingly recognising the power of operating as 'intelligent' businesses. A core component on the path to becoming an intelligent business is fostering a 'Data Native Culture'. And culture is something that starts from the top. You can't expect it to happen without leaders not only putting in place the right infrastructure, but also embodying what it means to operate as a 'data native'.

So how do they do that? Leaders need to set the example by embracing data, analytics and digital. By doing that, they will enable new ways for their employees to access, collaborate and work which break down silos and drive analytics adoption across their businesses. They need to have the right tools in place–from easy-to-consume dashboards and self-service solutions to advanced Artificial Intelligence–that deliver intelligence at the point where decisions are being made. That ability starts new conversations and inspires actions across teams.

We need to help existing managers–at all levels–get comfortable with and embrace data and analytics. They may not become 'data natives' or experts themselves, but they need to embrace the advantages of data and analytics. So, education is important here, especially to create a bridge between the data science and traditional business worlds.

Of course, you must have the right talent in place to take advantage of the initiatives their organisations put in place. A 2015 study by INSEAD[2] showed a clear correlation between talent competitiveness and the strength of an economy. Today, the UK is facing an unprecedented situation where many traditional skills are at risk of becoming irrelevant. This would render huge swathes of the population potentially unemployable and the talent market uncompetitive.

Initiatives like the Teen Tech, Data Science Award–sponsored by Accenture–gives school students a practical introduction into the exciting world of Data Science, providing them with an opportunity to analyse 'real world' datasets. But the prize is not just about inspiring young people at school. We also want to give teachers and leadership teams the confidence to develop powerful strategies to help students understand this emerging career opportunity and why they might very much enjoy being part of that world.

As this report highlights, educating as broadly as possible is essential. We need a population that understands the opportunities provided by digital (and data in particular). We want them to be able to actively engage with the digital market, and be willing to trust the complex and new digital world. Achieving that requires teachers who can both inspire and inform future generations, as well as enlighten those who feel left behind by the ever-quickening digital revolution.

We also need to financially support the research programmes that will enable the UK to be a leader rather than just keep up with others. Facilitating ideas, theories and new concepts will make the UK the engine room for digital innovation, providing a blueprint for others to follow. However, without the necessary investment in research, we won't reach that goal.

As well as a commitment to research, we need to develop the right environment for people to share ideas, work together and see how they can turn ideas into actions and them into successful digital businesses. Developing a national start-up ethos and creating an ecosystem throughout the UK are both essential for the UK's digital leadership.

If we continue to build on the developments that this report highlights, and make continuous investment in the UK's data skills, there's every reason to be confident for the future. All of us have a role to play in building awareness, making the right investments and striving to ensure that data and analytics really are part of the national conversation in the UK.

ACKNOWLEDGEMENTS

Many thanks to all members of the Data Skills Taskforce for their contributions to this briefing. In particular:

JOSEPH BUCKLEY
Policy Manager - British Academy

BOB CLIFT
Head of Higher Education Programmes - The Tech Partnership

SUE DALEY
Head of Programme for Cloud, Data, Analytics and AI - techUK

MAXIME DELATTRE
Policy Adviser (Skills) - British Academy

RAY EITEL-PORTER
Managing Director - Accenture Analytics

SANDY GROM
Assistant Director, Digital and Tech Policy Directorate - DCMS

AMY ROGERS
Business Manager, IT and Computing, Qualifications Product Management - Pearson

SAMUEL ROSEVEARE
Policy Researcher - Universities UK

OLIVIA VARLEY-WINTER
Policy and Research Manager - Royal Statistical Society

DR. GEORGE WINDSOR
Data Skills Taskforce

CONTENTS

INTRODUCTION

Data continues to transform the economy, increasing efficiency and creating new opportunities for innovation. The UK is in a strong position to reap the rewards of our increasingly data rich lives. But despite advances in both the perception of data as a resource for companies, and burgeoning government support for digital skills, the evidence shows that the UK's potential is not yet being met.

Nesta's report, *Skills of the Datavores*[3], found that data-driven companies are over 10 per cent more productive than 'dataphobes'. However, the data-driven companies that were surveyed in 2015 were struggling to find suitable talent. The research showed that two-thirds of 'datavores'–those businesses that make heavy use of data for driving their business decisions– who tried to recruit analysts in the previous 12 months struggled to fill at least one vacancy, and demand for people with these skills has only grown since we launched this research.

While data has been seen by many as part of the answer to the UK's productivity gap with other countries, it appears that barriers to accessing analytical talent are preventing businesses from fully capitalising on the 21st Century's flood of data.[4]

It's clear that core analytical skills as well as highly skilled talent is still needed. Nesta's research into the experience of datavores is now familiar to organisations working to address perceived gaps when it comes to data capability in UK businesses. Alongside this, the work of academics and other public bodies like the Tech Partnership, the Royal Statistical Society (RSS), the Nuffield Foundation, the British Academy and the DataLab in Scotland presents incredibly powerful evidence showing a strong link between data, business innovation and productivity. techUK analysis reveals the UK could create between 2.7 and 3.5 million new jobs by 2030, all requiring digital skills. The skills gap will be most profound in the big data and data analytics sector which is expected to count for the largest proportion of UK digital vacancies according to a survey of techUK members, 62% will require more big data capabilities between now and 2019.[3]

Addressing these issues becomes more urgent every day–consider, for instance, the UK's challenging economic context–not least our long-standing low productivity relative to other G8 nations, but the uncertainty surrounding outcomes of Brexit lends a great sense of importance to getting this right.

Analytic Britain[5] set out an agenda for change in the UK. The data skills challenge is well articulated. But, are we meeting that challenge? We revisit progress in this document, and establish principles to guide our next steps.

WHAT HAS HAPPENED SINCE THE PUBLICATION OF ANALYTIC BRITAIN?

The recommendations in *Analytic Britain* spanned the whole analytical talent pipeline, including schools, colleges, universities and the labour market and industry. They aimed to remedy skills shortages in the short term, while ensuring a sustainable supply of excellent analytical talent in the longer term. This section assesses where steps have been made in the provision of data skills.

EVIDENCE OF GOOD PRACTICE
SCHOOLS AND COLLEGES

Stronger teaching of mathematics and statistics in schools and colleges

The independent review of mathematics education in England by Professor Sir Adrian Smith was published in July 2017. The review was prompted by the fact that, in comparison with competitor economies, a low percentage of students in England continue to study mathematics after the age of 16. The review notes inequalities in uptake of mathematical subjects in terms of geography, gender, and ethnicity, and recommends greater support for schools, colleges and teachers to offer a range of qualification pathways from 16-18 to meet a variety of needs. As the RSS has discussed in its **Data Manifesto**[6], study pathways for students aged 16-18 include functional skills, core maths, A-level and AS-level mathematics and further mathematics, and A-level and AS-level statistics. The independent review found that the government will need to review disincentives for schools to offer these subjects and improve funding, urgently in the case of further mathematics, and core maths. The government has responded with announcement of a new £16 million Level 3 Maths Support Programme[7] to build on the momentum created by the further mathematics and core maths Support Programmes. Students will also need to be better informed of the benefits of participation, through up-to-date resources on careers and higher-level study, and clear signalling of support from universities.

The British Academy has committed to working with its sister national academy, the Royal Society, Government and Higher Education institutions to make clearer to potential applicants the importance of choosing appropriate qualifications at Level 3 if they wish to study undergraduate courses with a significant quantitative element, but also the number of possible pathways which facilitate this.

Developing data science relevant qualifications

General Qualifications are designed to meet stipulated content and assessment requirements set out by the Department for Education (DfE) and the Office of Qualifications and Examinations Regulation (Ofqual) and recent developments in teaching and learning content include:

- **GCSE, AS and A-level Geography qualifications have had the assessment of mathematical and statistical skills strengthened. This includes cartographic, graphical, numerical and statistical skills. A-level geography now includes a non-examination assessment to assess the independent investigation. The investigation will include fieldwork data, research and/or secondary data and independent presentation, analysis and evaluation of data.**

- **Across the science portfolio, there are now formal assessment targets for maths within science. For A-level, this means that 10% of the marks in biology, 20% in chemistry and 40% in physics must now assess maths–at Level 2 or above.**

EVIDENCE OF GOOD PRACTICE

Pearson have provided guidance on the teaching of maths within science for the first time at A-level; and supported continuing professional development (CPD) in biology that delivered statistics alongside fieldwork training.

The Department for Education's Post-16 Skills Plan has further underscored the importance of technical skills[8] to support students over the age of 16 in obtaining additional technical knowledge and practical skills valued by industry. Qualification providers are incorporating data analysis skills relevant for the workplace in their qualifications. For example, Pearson has responded to this challenge by embedding practical learning and work ready data analysis skills in business, computing and IT qualifications, such as the BTEC National Diploma in Business Information Systems and the BTEC Technical Certificate in Digital Technology and Data Management Pathway, both of which focus learners on the development of data manipulation and analysis skills in a business context.

Improving information about analytical career prospects and role models in schools and colleges

During 2017 techUK ran its Big Data Heroes campaign to celebrate the work of UK leaders driving forward all aspects of the Big Data industry.[9] The campaign championed many different types of careers available in Big Data in order to inspire and encourage more people to enter careers in the data industry.

Since 2015, the Royal Geographical Society, supported by the Nuffield Foundation, has been leading the Data Skills in Geography Programme, which

focuses on schools while drawing upon expertise in higher education and good practices in the schools sectors. The Programme, which has been seen as a role model for other learned societies, aims to enhance and support teachers and students in their understanding of data skills, confidence in their use and application and knowledge of their value to further study and employment. The outputs of the Programme include:

- **10 high-quality online resource modules to support the teaching of data skills embedded in GCSE and A Level; including specific support for the A Level 'individual investigation' through which students will collect, analyse and draw conclusions from a range of data sources.**

- **A programme of CPD to provide face-to-face practical training (full day and twilight) across England and Wales, also supported by online materials, for c. 1,000 geography teachers and those entering Initial Teacher Training.**

- **Liaison with exam boards, Initial Teacher Education departments, Teaching Schools, academy chains and other relevant organisations and individuals to share good practice, maximise the reach and impact of the project, and to help provide sustainability for this work into the future.**

- **Workshops and seminars that aim to share expertise across disciplines and to share our learning on the project.**

As highlighted in *Analytic Britain*, the Open University has been piloting an approach to teaching data skills to 10 to 18-year-old students. The Urban Data School project took place over two and a half years in Milton Keynes using datasets from a smart city project that has recently concluded.

EVIDENCE OF GOOD PRACTICE

These datasets were incorporated into lesson plans and practical activities which followed a 'data-inquiry' method that prompted active exploration of data. The focus was on developing core data literacy competencies around asking and answering questions from complex datasets that would in turn support the learning of practical data analytic skills throughout the different key stages.

A key finding from the successful pilot was that teachers were interested in using the data as part of teaching, and students, including primary school students, proved themselves very capable of engaging with the data. Of particular importance in capturing the interest of students was the use of local smart city data that was of immediate relevance to them. A significant advantage of the approach was that it could be placed within and could support the teaching of science, geography, computer science or maths and even art/design or physical 'making' activities. The versatility of the piloted approach will allow the teaching of data skills to students beyond the expected cohort.

Supporting the development of extracurricular data activities

The TechFuture Classroom[10], from the Tech Partnership, provides projects for students introducing them to data and data analytics co-developed with employers, including SAS UK and Capgemini. Students are also offered Open Badges for completion of these projects, which are then shared through the Mozilla Backpack and enhance CVs and formal qualifications as a sign they have studied more than just the traditional curriculum. The SAS UK project guides students through data analytics, using the JMP software and the scenario of Year 8 students falling ill with an unknown virus. By analysing provided datasets, students find out how the virus started, what it is, and how it can be treated. The project is supported by video tutorials to help them understand the software and some of the mathematics behind the analysis. The project developed with Capgemini explores data representation and storage, and students are challenged to find a suitable location for a data centre, taking into account a set of variables impacting on the choice. Along the way students find out more about cloud computing, its benefits and risks.

For these to help build our data skills pipeline, it's critical the work in schools and colleges continues beyond successful pilots, and initiatives by The Urban Data School and Royal Geographical Society are rolled out further.

UNIVERSITIES AND VOCATIONAL EDUCATION

Developing the Q-Step initiative

The Q-Step Programme is a £19.5 million initiative, co-funded by the Nuffield Foundation, the Economic and Social Research Council (ESRC) and the Higher Education Funding Council for England (HEFCE), designed to promote a step-change in undergraduate quantitative social science training in the UK. Launched in 2013, the Programme is being delivered over a six-year period by 15 Q-Step Centres and three affiliates[11], all based at UK universities.

So far, over 68 new degree programmes and 172 modules have been developed, and in the most recent year, over 750 students started Q-Step degree programmes and over 8,000 were participating in at least one of the Q-Step modules. The offer to students is brought together in a prospectus, Shaping Society: Quantitative Social Science for the 21st Century[12], which allows students, parents, carers, and teachers to access information about all available Q-Step courses in one place.

A very distinctive feature of Q-Step has been the use of work placements and internships where undergraduates, either as a formal and credit-bearing part of their study or as an enrichment, have an opportunity to test and stretch their quantitative skills on live projects. Over 130 employer and research hosts have taken on Q-Step students to date.

Q-Step is increasingly seen as contributing to the supply of science, technology, engineering and mathematics (STEM) skills as it develops quantitative and scientific thinking in a wide range of social science contexts including education, geography, international relations, law, linguistics, political science, population health, philosophy, politics and economics, and sociology. This view was set out in the Foundation's response to the Government's 'Industrial Strategy'[13] and Q-Step's contribution to the development of undergraduate mathematical skills was also picked up in the recent Smith Review.[14]

The Programme was reviewed in 2016 and will be formally evaluated as it approaches the conclusion of this funding period at the end of 2018.

ESRC's Quants methods initiative

This ESRC's Quants methods initiative is a secondary data analysis programme which benefits from the support of the UK Data Service. It aims to improve capacity in quantitative social sciences and make the best possible use of the UK's world-class data infrastructure.

The programme covers the entire educational life course from school projects to postdoctoral research and all social sciences disciplines. It includes both research, teaching and learning.

The British Academy's work on Quantitative Skills

In 2015, the British Academy published the report *Count Us In*[15], in which it offered a vision of how the UK can rise to the potentially transformational challenge

of becoming a data-literate nation. It called for a cultural change across all phases of education and employment, together with a concerted, continuous national effort led by government.

The following year, the Academy conducted a review of 16 social science departments across three continents, examining case studies of excellence in implementing quantitative methods in social science undergraduate teaching. This report, **Measuring Up**[16], acts as a helpful guide for UK higher education leaders to ensure social science remains at the cutting edge of global research. In addition, the British Academy convenes regular meetings of the High-Level Strategy Group on Quantitative Skills (HLSG) which includes representatives from the Department for Business, Energy and Industrial Strategy (BEIS), ESRC, Office for National Statistics (ONS), Nuffield Foundation, RSS, Advisory Committee on Mathematics Education, Academy of Social Sciences and Nesta. The HSLG supports projects such as the Q-step Programme and works on strategies to influence decision-makers in favour of the embedding of data skills in the teaching of social sciences at university.

Investing in doctoral training and data science

Since 2014, £40 million has been invested through the Engineering and Physical Sciences Research Council[17] in nine centres for doctoral training in different aspects of data, including Cloud Computing for Big Data and Data Science. These Centres bring together individuals from different disciplinary backgrounds to train postgraduate research students over a four-year period, providing them with technical training and challenge-based research.

The Alan Turing Institute[18], the national institution for data science, was launched in December 2015. The Institute was created by five founding universities, Cambridge, Edinburgh, Oxford, UCL and Warwick, and the Engineering and Physical Sciences Research Council. The Institute pursues its mission, to make great leaps in data science research to change the world for the better, by helping data scientists through doctoral training and pursuing theoretical development and application to real-world problems.

Investment in skills and research continues, with the establishment of a National Innovation Centre for Data with a significant skills element at Newcastle University. The initiative, which brings together industry, the public sector and world-leading academics, is being funded through a £30 million investment by BEIS and Newcastle University. The Centre will enable organisations to develop the skills, ideas and resources needed to exploit the opportunities by the explosion in data.

Promoting degree apprenticeships

Degree apprenticeships were launched by the Government, in 2014 and bring together the best of higher education and vocational training. Degree apprentices are full-time employees and benefit from on the job training, university tuition and study, without having to cover the cost of tuition.

The BSc Digital and Technology Solutions degree apprenticeship, which includes a data analyst specialism, was designed by employers working together through the Tech Partnership, and introduced in 2015 as the first of its kind in any sector. Since

its launch, over 700 employees from over 60 companies–including Accenture, Atos, BT, Capgemini, CGI, Ford, Fujitsu, Goldman Sachs, GlaxoSmithKline (GSK), IBM, John Lewis, Lloyds Bank and Virgin Media–have studied on this programme at 16 universities across England-such as Aston, Manchester Metropolitan and Queen Mary London.

Following the success of the BSc Digital & Technology Solutions degree apprenticeship a number of employers, led by the ONS, are creating a BSc Data Scientist degree apprenticeship which should be ready to take its first degree apprentices from September 2018.

LABOUR MARKET AND INDUSTRY

techUK Big Data Skills Gap Report

In October 2016 techUK released its report **Understanding, Demystifying and Addressing the UK's Big Data Skills Gap**[19]. This industry driven report identified the eight key job roles and skills needed to implement a big data project and considered where the current skills gap exists and potential threats to combating the gap. It also made a number of recommendations relating to the need to build the domestic data skills pipeline and the UK's continued ability to attract the best data talent from around the world. The report also included profiles of UK data leaders collected as part of techUK's Big Data Heroes campaign[20].

techUK Big Data in Action Roadshows

During 2016 techUK held a series of Big Data in Action regional roadshow events across the UK in partnership with the Federation of Small Businesses and the Hartree Centre. These events aimed to raise awareness of the value of data for businesses of all sizes and sectors; a key recommendation in **Analytic Britain**.

Data and Analytics Awareness in Business

Since the publication of **Analytic Britain** there is evidence that businesses and public institutions increasingly recognise the importance of data and analytics, and the skills to leverage these, for business success. Gartner, Inc.'s **Predicts 2016: Information Strategy report**[21] found the number of large organisations having a Chief Data Officer between 2014-2015 more than doubled from 400-1000; with a prediction that 90% of large organisations will have a Chief Data Officer by 2019. The appointment of a senior executive to spearhead the use of data and analytics is essential to foster the right environment for hiring and growing data skills, and for the widespread adoption of a data-driven approach to decision-making. Organisations are also increasingly partnering with academia and private companies, to help drive innovation in the area of data and analytics, and to help fill skills gaps. For example, The Turing Institute has already announced strategic partnerships with HSBC, Intel, Lloyds Register, Government Communications Headquarters (GCHQ) and Microsoft, with more to follow. Other organisations, such as the CBI, are also working to help their members upskill in digital and data skills, and the imminent implementation of the General Data Protection Regulation (GDPR) legislation is acting as a forcing mechanism to revisit and improve data practices.

THE DATA SKILLS TASKFORCE

THREE PRINCIPLES FOR THE DATA SKILLS TASKFORCE

Distilling, and prioritising recommendations made in *Analytic Britain*, the Data Skills Taskforce will work to three principles to develop Data Skills for the future. They are:

1 Raise awareness of the value of data for UK businesses

It has been reported by members of the Data Skills Taskforce, that despite a growing awareness of the value of data to UK companies, there remains a significant tranche of businesses, particularly small and medium sized enterprises, that has not embraced the data revolution. In previous Nesta research[3] it was found that around 30 per cent of the sample, work with few, small datasets, and rarely use analysis to make decisions. They are referred to as 'Dataphobes'. There is therefore work to be done to highlight where opportunities might exist. Importantly, information is required on how companies could go about identifying, and capitalising on these opportunities.

2 Raise awareness of data science career opportunities for young people

Awareness of the importance of data skills is a fundamental precursor to securing the right skills for the data-driven economy. Without the perception that data skills are valuable for development of a dynamic, fulfilling and well paid career, young people will not seek the skills that companies require.

We need to get young people engaged. Happily, Tech Partnership has taken on the mantle, providing information about digital careers. In particular, its TechFuture initiatives, including TechFuture Careers, TechFuture Girls and TechFuture Classroom, bring together practical lesson guides, group activities and industry experience to educate students about the types of tech jobs available and the paths they need to follow to get them. Especially welcome is the fact that, over the last 18 months, the presence of data analytics occupations has been boosted on Tech Partnership's platform.

Initiatives like the Teen Tech Data Science Prize, sponsored by Accenture, aims to do this through setting an interactive challenge for school teams to develop projects based on data sets. Teams are supported throughout the challenge with mentors and detailed resources, allowing students to learn first-hand how data scientists extract insights from data to aid decision making.

The long term, large scale impact is to help schools change their approach to science and technology, through equipping teachers and leadership with the strategies to educate and inspire students about the world of data science, and the exciting opportunities available to them within that world.

Awareness raising must take a number of forms, one of which is at a national level through institutions such as the Alan Turing Institute, the Data Skills Taskforce, TechUK, Nesta, and the UK government are important parts of the data skills ecosystem. They provide a platform on which a community of companies, charities and third sector organisations, policy makers and education stakeholders can engage in data analytics.

3 Develop links between government, businesses, and educators

The government's 2017 Digital Strategy[22] outlines a commitment to working with the Data Skills Taskforce to help implement key elements of the *Analytic Britain* report– Securing the Right Skills for the Data–Driven Economy.

Members of the Taskforce welcome this support. In order to implement the recommendations made in *Analytic Britain*, and critically, respond to the changing needs of companies in the UK, we must continue to be industry led and highly collaborative–grounded in the realities of a diverse range of businesses–from micro enterprises, to tech giants.

WHAT'S NEXT FOR UK DATA SKILLS?

As shown, a great deal of progress has been made against the recommendations made in *Analytic Britain*. However, the UK data landscape has developed considerably over the last 18 months since its publication. Priorities have been sculpted by global trends, including the creation of increasing amounts of data, adoption of new technologies, and the shifting political climate. There is therefore, a need to understand the landscape as it evolves, monitor change, and tailor policy and practical responses to ensure that the right supply of skills is available to meet demand from companies now, and for the future.

As a first step in this process, the Data Skills Taskforce seeks involvement from a broad range of UK businesses and data skills stakeholders. As such **we call for stakeholders to register their interest in being part of the Data Skills Taskforce.**

For more information please contact us at **DataSkillsTaskforce@accenture.com.**

ANNEXE 1: A SUMMARY OF DATA SKILLS ACTIVITY IN THE UK

This is a summary of activity not included elsewhere. It is not intended to be comprehensive, but indicate the direction in which the UK data landscape has been travelling over the last 18 months. We welcome additions to, and feedback on this list.

- ESRC are providing £19.5M for the Q-Step initiative to support the development of specialist data-specific undergraduate programmes.

- BEIS has invested over £40 million since Autumn 2014 in nine centres for doctoral training in different aspects of data.

- The Alan Turing Institute launched in December 2015. One of its key roles is to help data scientists through its doctoral training programme.

- National Innovation Centre for Data, with a significant skills element, is being created at Newcastle University with £15m BEIS and £15m match funding from Newcastle University.

- The Department for Digital, Culture, Media and Sport (DCMS) is supporting the industry led Data Skills Taskforce that is examining ways to increase the supply of data skills.

- DCMS provided funding to support development and marketing of innovative pilot computing science degree conversion courses, predominantly at postgraduate level. Through this initiative, 50 graduates with data analysis skills will be available to industry from summer 2017 onwards.

- In 2015, four digital roles were added to the Shortage Occupation List, including a data scientist role–to ensure companies are able to access the skills they need for growth.

- Two of the nine universities offering digital degree apprenticeships offer specialisms in data analysis. Data fundamentals are also a core part of every digital degree apprenticeship.

- Tech Partnership recently announced it was developing, in conjunction with industry, a data degree apprenticeship.

  - A data analyst apprentice standard has been approved and is available for delivery by employers.

- Private sector companies, such as Pivigo, have emerged which are devoted to helping data-skilled individuals in academia make the transition into industry.

- techUK's Big Data Heroes campaign celebrated and promoted the UK industry data leaders, to inspire and encourage more people to enter careers in the data industry.

- techUK held a series of regional Big Data in Action roadshow events to raise greater awareness of the value of data for businesses of all size and sector.

- techUK published its report, *Understanding, Demystifying and Addressing the UK's Big Data Skills Gap*, making a number of key recommendations to address the data skills gap.[23]

ANNEXE 2: DATA SKILLS TASKFORCE AFFILIATES[24]

Accenture	The DataLab
Aimia	The Department for Digital, Culture,
Boots	Media and Sport
Cisco	The Digital Catapult
Direct Line Group	The Hartree Centre
IBM	The Open Data Institute
Nesta	The Royal Society
Pearson	The Science and Technology Facilities
Pivigo	Council
SAS	The Society of Data Miners
techUK	The Tech Partnership
The Alan Turing Institute	Universities UK
The Cabinet Office	University College London

REFERENCES

[1] Annexe 2

[2] https://knowledge.insead.edu/career/the-worlds-most-talent-ready-countries-2015-4467

[3] Mateos-Garcia, J., Windsor, G., and Bakhshi, H. (2015) Skills of the Datavores: Talent and the data revolution.   Nesta: London.

[4] http://www.ibmbigdatahub.com/infographic/flood-big-data

[5] Nesta and UUK (2015) Analytic Britain: Securing the right skills for the data-driven economy. Nesta/ UUK: London

[6] http://www.rss.org.uk/RSS/Influencing_Change/Data_manifesto/Education_and_skills_for_the_data_economy/RSS/Influencing_Change/Data_democracy_sub/Education_and_ skills_for_the_data_economy.aspx?hkey=9cd80f64-6260-4502-97cf-6c1f47af2a72

[7] https://www.contractsfinder.service.gov.uk/Notice/7032806c-2e52-4d55-a89d-91e4cf34bb7d?p=@T0=NjJNT08=UFQxUlRRP

[8] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/536043/Post-16_Skills_Plan.pdf

[9] https://www.techuk.org/insights/news/item/7636-are-you-be-a-big-data-hero

[10] http://www.techfutureclassroom.com

[11] http://www.nuffieldfoundation.org/q-step-centres-and-affiliates

[12] http://www.nuffieldfoundation.org/sites/default/files/files/Q_Step_Prospectus_final_web_spreads(1).pdf

[13] http://www.nuffieldfoundation.org/sites/default/files/files/NUFFIELD_INDUSTRIAL_STRATEGY_ RESPONSE_FINAL.pdf

[14] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/630488/ AS_review_report.pdf

[15] http://www.britac.ac.uk/count-us-in

[16] http://www.britac.ac.uk/publications/measuring

[17] https://www.epsrc.ac.uk/skills/students/centres/

[18] https://www.turing.ac.uk/

[19] https://www.techuk.org/insights/reports/item/9469-the-uk-s-big-data-future-mind-the-gap

[20] https://www.techuk.org/insights/news/item/7636-are-you-be-a-big-data-hero

[21] Laney, D., Duncan, A. D., Faria, M., Logan, D., & Dayley, A. et al. (2015, December 09) Predicts 2016: Information Strategy. Retrieved from Gartner Research Database (http://www.gartner.com/doc/3177017).

[22] https://www.gov.uk/government/publications/uk-digital-strategy/2-digital-skills-and-inclusiongiving-everyone-access-to-the-digital-skills-they-need

[23] https://www.techuk.org/insights/reports/item/9469-the-uk-s-big-data-future-mind-the-gap

[24] Organisations that are, or have been involved in the Data Skills Taskforce since its establishment in 2015

ABOUT THE DATA SKILLS TASKFORCE

The Data Skills Taskforce, chaired by Accenture, sets an agenda for change to inspire, educate and upskill data talent, drawing on best practice from the UK's leading institutions. The taskforce was established to review and promote recommendations made in Analytic Britain, across schools, universities and the labour market at large. It comprises UK businesses, data skills stakeholders and the Department for Digital, Culture, Media & Sport.

Visit us at
www.accenture.com/data-skills-taskforce

Or for more information contact:
DataSkillsTaskforce@accenture.com

ABOUT ACCENTURE

Accenture is a leading global professional services company, providing a broad range of services and solutions in strategy, consulting, digital, technology and operations. Combining unmatched experience and specialized skills across more than 40 industries and all business functions – underpinned by the world's largest delivery network – Accenture works at the intersection of business and technology to help clients improve their performance and create sustainable value for their stakeholders. With more than 394,000 people serving clients in more than 120 countries, Accenture drives innovation to improve the way the world works and lives. Follow us **@AccentureUK** and visit us at **www.accenture.com**.

ABOUT PEARSON

Learning isn't a destination, starting and stopping at the classroom door. It's a never-ending road of discovery, challenge, inspiration, and wonder. For many people, learning is the route to a job to support their family, or to the skills that will help them progress in their career. For others, it's simply a passion for discovery. Whether it's at home, in the classroom or in the workplace, learning is the key to improving our life chances. To this end, Pearson provides a blend of content, curricula, assessment, training and information systems to make learning more engaging and effective. Technology underpins everything we do, from the latest resources for personalised learning to data analysis tools to measure progress and aid teaching. By putting technology at the heart of learning, we aim to support, motivate and inspire every educator and every learner. In today's world, education isn't just about gaining qualifications: it's about helping learners at every stage of the journey discover a love of learning that helps provide opportunities throughout their lives. Because wherever learning flourishes, so do people.

Visit us at **https://www.pearson.com/uk/**