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FUELLING FINTECH

ATTRACTING THE UK'S FUTURE TECH TALENT INTO FINANCIAL SERVICES

March 2019

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About TheCityUK

TheCityUK is the industry-led body representing UK-based financial and related professional services. In the UK, across Europe and internationally, we promote policies that drive competitiveness, support job creation and ensure long-term economic growth. The industry contributes over 10% of the UK's total economic output and employs 2.3 million people, with two thirds of these jobs outside London. It is the largest tax payer, the biggest exporting industry and generates a trade surplus almost equivalent to all other net exporting industries combined.

About Odgers Berndtson

Odgers Berndtson advises boards and executive committees on senior appointments. We deliver executive search, succession planning and assessment services to organisations across the world in over 50 sectors. Our dedicated financial and professional services practices work in partnership with commercial and public organisations to help them find and attract diverse executives and non-executives.

About Santander

Santander UK is a financial services provider in the UK that offers a wide range of personal and commercial financial products and services. It has brought real competition to the UK, through its innovative products for retail customers and relationship banking model for UK SMEs. At 30 June 2018, the bank has c24,200 employees. It serves around 15 million active customers, via a nationwide branch network, telephone, mobile and online banking; and 64 regional Corporate Business Centres. Santander UK is subject to the full supervision of the Financial Conduct Authority (FCA) and the Prudential Regulation Authority (PRA) in the UK. Santander UK plc customers are protected by the Financial Services Compensation Scheme (FSCS) in the UK.

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FOREWORD

The roles which create the most value in financial and related professional services are changing fast. Increasingly they are becoming more technology based, whether it be in banking (digital customer interfaces), insurance (big data), or legal services (Artificial Intelligence and machine learning).

Critically this will demand a dramatic shift in the skills profile of financial services firms. One leading provider has even predicted that data scientists will become the fourth largest category of employees.

New roles that are seen in the sector require skills that have not traditionally been recruited together in the same person. For example, a detailed understanding of regulation that is combined with technology, or a sophisticated level of numeracy combined with communication skills.

Attracting this quantity of tech talent will see financial services call upon a much wider range of graduates than ever before, bringing it for the first time into direct competition with other industries, especially the major tech firms.

Yet aside from a few exceptions, there's currently little communication and collaboration between educators and the organisations that require this type of differently skilled, hybrid talent.

Moreover, there is no network of placements, little research into the skills needed for financial and related professional services, or transfer of people skills on a regular basis between industry and academia. This is in contrast to engineering and the healthcare or pharmaceuticals sectors.

Through a thorough understanding of the current situation, its demands and potential, our report aims to identify the talent gaps and suggests ways to fill them.

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EXECUTIVE SUMMARY AND RECOMMENDATIONS

The financial and related professional services industry is going through a revolution. It is an industry facing unprecedented change driven by digital technologies which are transforming how work gets done, how organisations interact with their customers and how decisions are made.

The pace of technological change in the industry is accelerating, with significant shifts in investment, with the likes of Artificial Intelligence (AI), Augmented Reality (AR) and blockchain gathering momentum.

This change and the speed of it, risks creating a significant misalignment between the tech skills required by financial services firms and those leaving academia at all levels, particularly those who traditionally would be looking for roles within the industry.

As part of their work for HM Treasury, TheCityUK and Santander identified that many financial services firms struggle to integrate and retain tech talent, and have concerns over the quantity of talent which will be available in future. They therefore decided to identify the skills required by the industry in the next five to 10 years. This is being fed back to the university community, with support from the Russell Group, to help ensure future course programmes can respond to areas of opportunity, and help ensure students are equipped with relevant and employable skills.

This report is based on in-depth, face-to-face interviews with over 50 leading professionals across banking, insurance, asset funds management, legal services and market infrastructure.

The objective was to probe how well aligned the skills currently supplied by UK universities are with those required by our interviewees and their organisations to enable FinTech innovation and adoption.

The findings and recommendations (listed below) have been shared with the Financial Services Skills Taskforce commissioned by the Chancellor and convened by TheCityUK.

Findings

Data on skills demand is weak: though it has been clear for a number of years that technology is having a major impact on the industry, few of the organisations interviewed maintained data on the numbers of employees needed to deliver their digital strategies over the next five years, particularly the precise mix.

Where individual firms do have data on skills required, it is rather incomplete and based on an element of guesswork on how individual organisations envisage the direction in which emerging technology will take them and their customers.

Where data is available from organisations, it highlights that skills required by financial services firms are changing significantly. Skills such as coding and software development, user experience, product design, data science and cyber are on the increase at all levels.

AI, data science, blockchain and coding skills are all highly sought after. These roles are struggling to be filled, particularly in those cities outside of London with a significant financial services presence such as Edinburgh, Leeds and Manchester.

Conversely, the proportion of traditional financial services roles required, such as those in sales, finance and tax, and general management are on the decrease, especially relative to the business as a whole.

There is a need to create a pipeline of graduate talent: the industry will need to work collaboratively with academia and government to ensure the skills required are available in the volume and locations needed. This will probably entail more formal links with academia. In too many cases this has been based on ad hoc relationships between individual firms and academic institutions. The industry must be prepared to follow the example of other industries and look beyond its traditional base to find the skills it needs.

Greater leadership is needed on reskilling the current workforce: the changes in technology and customer expectations will have a profound effect on those already working within financial services. Individual organisations are struggling with how best to undertake the reskilling of their workforces.

The task of reskilling large numbers of people will require the government and industry to work together to facilitate the retraining of the existing workforce over the coming years in emerging skills which will come to dominate the workplace.

Other industries can provide lessons on incorporating business exposure into academic teaching: industries such as pharmaceuticals and manufacturing have well developed industrial placement schemes, which benefit both graduates and employers. Though financial services have similar schemes, particularly in investment banking, there is not one in place for FinTech. The financial services industry should therefore work with interested academia to develop one.

Diversity is an issue: diversity in executive leadership of organisations drives improved financial performance. Research shows that diverse workforces are more likely to have financial returns above their national industry medians. The EY Centre for Board Matters identified that 'board composition' was one of the top priorities for 60 institutional investors in 2018, with diversity the first priority for 82% of respondents.[1]

Industry seeking to draw upon tech talent must find ways to make technology roles more attractive to women. It should look to government for support and coordination on how this issue could be tackled and improved.

The financial services industry must also look further afield than its traditional narrow graduate base to build greater diversity within the sector, making better use of schemes which improve access.

Brexit has created concern over the availability of future tech talent from the EU: financial services organisations are concerned that Brexit will shrink the available talent pool of the best graduates. According to the recent LinkedIn Workforce report, which surveyed 600 hiring and recruitment managers in the UK, up to 20% of graduates with the required tech skills in the sector are from the EU.[2]

The report highlighted that since the Brexit vote in June 2016, there has been a significant decrease of graduates coming to the UK from France and Germany in particular. More worryingly, those surveyed said since the Brexit vote, UK recruiters and hiring managers have seen a net migration of tech graduates back to the EU. There is a risk that those talented migrants with the skills needed by the UK will leave before these skills can be replaced by home-grown talent.

1 EY Center for Board Matters, 'Top priorities for boards in 2019', (Dec 2018), available at: https://www.ey.com/gl/en/issues/governance-and-reporting/center-for-board-matters/ey-top-eight-priorities-for-european-boards-in-2019

2 LinkedIn, 'Workforce Report', (December 2018), available at: https://economicgraph.linkedin.com/resources/linkedin-workforce-report-december-2018

Recommendations

FinTech and emerging technologies are having a significant impact on financial and related professional services. Employing and retaining staff with the right tech skills is becoming more difficult for the industry, especially at a time where a number of sectors are seeking employees with similar skill sets.

From the information that we have gathered, it is clear that to ensure FinTech continues to go from strength to strength in the UK, a number of issues will need to be addressed and the way that the sector interacts with government skills policy and academia requires significant change.

Set out below are some recommendations on how that could be achieved:

Collect and publish skills demand data: there is a need for the industry to collaboratively produce data on the types of skills and numbers of roles projected to be needed over the next five to 10 years. This could then be used when talking to academia and government to create a common understanding. Such data could be accumulated and published by the Department for Education and Department for Business, Energy and Industrial Strategy, under the joint remit of the Minister of State for Universities, Science, Research and Innovation. Bodies such as the Russell Group, which represent universities, could provide further analysis on how the demand will be met, flagging any potential gaps.

Designate FinTech as an issue for Boards: to boost awareness within senior management of the FinTech skills required, ensure that risks associated with tech, related controls and desired outcomes are discussed regularly by the whole Board, rather than delegated to the Chief Technology Officer or equivalent figure.

Engage with public sector initiatives: firms should capitalise on the various government-led initiatives which have been established in recent years to assist tech literacy. Many of the schemes are seeking a private-sector partner and for engagement from practitioners. In return, firms will be provided with training support and best practice guidance.

Formalise and embed work placements schemes within university degrees: to ensure applicability of tech talent within the business, a number of financial and professional services firms have developed bilateral relationships with specific universities. However, though beneficial for the individual firm and the graduate, these are relatively small scale and will not address the broader industry challenges outlined in this report.

Universities should increase tech content in non-tech courses: as tech skills are required in a range of roles across all sectors, our research has indicated a clear demand from employers to increase the numeracy and tech literacy of students across a whole range of non-tech degrees. Universities should look to develop initiatives to increase the tech content in non-tech degrees. A leading example is how Imperial College London has modularised significant amounts of undergraduate content, including on coding, data analytics and AI, to enable easier incorporation in other courses.

Government, industry and universities should work together on reskilling: given it is beneficial to the economy as a whole for the UK's workforce to be constantly updating its skills to fit businesses' requirements for the future, the government should provide funding to universities and Further Education institutions to ensure support is provided to business on reskilling in areas, such as the use of technology in traditional financial services areas.

Careers advisors should promote financial services: respondents to this survey were clear more was needed to promote the industry at both school and Further Education. Industry ambassadors should break down the narrow perception of employment in financial services, and bring to life the breadth and depth of skills and roles on offer. Discussions between industry, government and academia should take place on how best to achieve this.

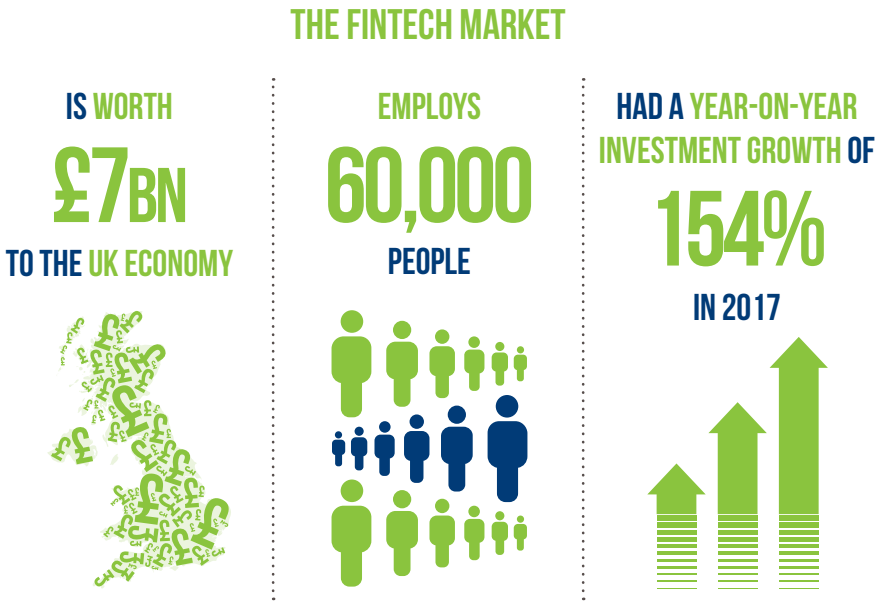
The industry needs to cast its net wider to attract talent: financial services firms must set out strategies for attracting tech talent from other sectors and industries.

Promote diversity: diversity continues to be a significant concern within financial services. Given the current imbalance between the number of male and females studying tech degrees, this issue will only become exacerbated over time without specific attention. A successful example from which to learn is the 'Women in Engineering' initiative that has promoted greater gender diversity in that particular industry.

INTRODUCTION AND METHODOLOGY

The quantitative breakdown

The UK is at the heart of the global financial services market. It is the leading exporter of financial services across the world, with more banks' head offices in London than any other city. Financial and related professional services provide employment for 2.3 million people across the UK, or 7.4% of total UK employment. It is also the UK's largest generator of tax revenues, £14 out of every £100 in tax revenues are paid by the financial services, legal and accounting sectors. The rule of law, world leading regulation and the unique ecosystem ensure the UK is a place to develop new financial services businesses.[3]



Given the UK's financial services workforce is spread across many cities and regions, this is an issue of national importance. For example, in Scotland 8.6% of the total workforce is employed in the financial services sector. The East of England figure is 7.3%, South West 7.06% and Yorkshire 6.5%.[4]

According to recent data, there has been an increase in financial services candidates taking roles in cities such as Birmingham, Edinburgh, Glasgow, Leeds and Manchester.[5]

Financial services is going through a revolution. It is a sector facing unprecedented technological, cultural and regulatory change and this requires a range of new skills and talents. The introduction of new technologies to financial and related professional services is arguably the biggest and most pronounced shift.

It has already driven innovation especially in the area of customer experience, as well as helping develop new business models. The FinTech start-up sector experienced its best year of investment growth in 2017, with a year-on-year increase of 154%.[6] The FinTech

3 TheCityUK, 'Key facts about UK-based financial and related professional services, (April 2018), available at: https://www.thecityuk.com/assets/2018/Reports-PDF/38f60d8b7d/UK-key-facts-about-UK-based-financial-services.pdf

4 Office for National Statistics, 'Labour market profile', (December 2018), available at: www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/bulletins/uklabourmarket/december2018

5 TheCityUK, 'Key facts about UK-based financial and related professional services, (April 2018), available at: https://www.thecityuk.com/assets/2018/Reports-PDF/38f60d8b7d/UK-key-facts-about-UK-based-financial-services.pdf

6 KPMG, 'The pulse of FinTech, quarterly analysis of global investment trends in the fintech sector', (November 2017), available at: https://assets.kpmg/content/dam/kpmg/xx/pdf/2017/11/pulse-of-fintech-q3-17.pdf

market is now worth £7bn to the UK economy and employs 60,000 people.[7] In the first half of 2018 alone, total UK investment in FinTech reached $16bn.[8] This is likely to be greatly exceeded by those working on FinTech within existing financial and related professional services firms.

To sustain this growth, FinTech firms face challenges. Crucial among these is talent and skills, an issue that was identified in the recent interviews as well as TheCityUK's previous reports.[9]

Due to the rise of FinTech and the speed of the technology revolution taking place within the industry, the roles being created and skills required are significantly different from traditional financial services roles. This has created some difficulty for the industry with regards to recruitment.

Respondents from both the financial and professional services industry continually highlighted the need for people with skills such as product development, understanding of biometric AI and machine learning technologies, big data and analytics, and cloud and Application Programming Interface (API) expertise, adding that potential recruits must be able to thrive within a highly regulated environment.

There was also concern over the number and supply of data scientists, AI specialists and data engineers.

Research methodology

This report is based on in-depth, face-to-face interviews with 50 leading professionals across banking, insurance, asset funds management, legal services and market infrastructure. Discussions were also conducted with representatives of the Russell Group of universities and the Institute of Apprenticeships.

Respondents were also asked to fill out a skills matrix to provide an insight into where they felt their organisation would require skills for the next five years. Only 20% of respondents were able to provide us with a skills matrix. However, though the sample is relatively small it does resonate with other surveys that have been carried out recently on skills. Some of the skills in high demand highlighted were:

- big data and data analytics/scientists
- coding
- biometric technologies
- cloud based services
- AI and machine learning technologies
- optimisation engine technology
- digital marketers/product & design and analytics
- IT engineers
- cyber security.

As stated previously, this report was commissioned to help understand and probe the extent of any misalignment between the skills coming out of UK universities and those required by our interviewees and their organisations to drive forward FinTech innovation.

7 Deloitte, 'Global Fintech hubs', (April 2017), available at: https://www2.deloitte.com/content/dam/Deloitte/uk/Documents/Innovation/deloitte-uk-connecting-global-fintech-hub-federation-innotribe-innovate-finance.pdf

8 KPMG, 'The pulse of FinTech, quarterly analysis of global investment trends in the fintech sector', (November 2017), available at: https://assets.kpmg/content/dam/kpmg/xx/pdf/2017/11/pulse-of-fintech-q3-17.pdf

9 TheCityUK, 'Transformation and Innovation: a guide to partnerships between financial services institutions and FinTechs', (November 2017), available at: https://www.thecityuk.com/assets/research-report/ab70a860ae/Transformation-and-innovation-A-guide-to-partnerships-between-financial-services-institutions-and-FinTechs.pdf

FINTECH AND THE FUTURE PROFILE OF THE INDUSTRY

A more innovative, entrepreneurial industry

Financial services is changing and going through a revolution driven by new technologies and enhanced customer expectations.

FinTech was initially hailed as the big disruptor for financial services. However, it should be seen as the enabler which allows financial services to reorientate around consumers and clients in the digital age. This will lead to significant change in how the firms offering financial services operate, while Open Banking for example has assisted a range of new entrants.

Customer expectations have in parallel increased dramatically. Empowered by technology, today's consumers expect businesses to react to all their needs and wants instantly. Successful disruptors such as Amazon, Uber and Airbnb have exploited gaps in consumer demand, as a result customer expectation for products and services delivery have been transformed. In this environment organisations are using digital and a range of emerging technologies to enhance and transform the customer experience.

This has led to financial services organisations' significant need for people with skills such as product development, data science, data engineering, data analytics, cloud, AI, API and machine learning (ML).

Most established providers of financial services are yet to fully work through how disruptive technologies will impact their workforces. Many current employees do not specialise or have a deep understanding of the field. In some cases, even new graduates are not joining firms with the required digital skills.

Partnering with FinTech and tech start-ups has been seen as one of the most viable ways of attracting tech talent. Some banks have even created their own ecosystem of standalone companies, partnerships and venture capital networks.

An almost universal finding from the research was that for the industry to keep pace with FinTech advances, future financial services practitioners must have a more varied set of soft skills, centred on change and innovation.

> "Technical skills per se are not enough. Communication skills, commercial business understanding and humanity are vital."
>
> Survey respondent

This backs up the findings of a recent Deloitte report on 'Power-up skills' which reinforced the increased need for these human skills in industries facing risk of automation.[10]

It will require much greater levels of creativity and passion for the technology and evidence of entrepreneurial spirit, which helps counter act the often-defensive stance towards change or risk.

At the graduate level, it is fundamentally about recruiting more aspirational, digitally literate graduates. At the senior level, it requires leaders who are adept in both corporate and digital aspects.

10 Deloitte, 'Power up: UK skills boosting transferable skills to achieve inclusive growth and mobility', (2018) available at: https://www2.deloitte.com/content/dam/Deloitte/uk/Documents/Innovation/deloitte-uk-power-up-uk-skills.pdf

Incubators and tech champions

The speed at which firms are responding to FinTech varies across the sector. Of the businesses interviewed, there are a few ways in which these units have been established. Some of those at the forefront of change have set up small innovation teams at the heart of the business to consider the five-year outlook and how the business can more broadly connect to the FinTech community.

Several firms have established arm's length 'incubators' which sit separately from the main business, potentially at a different site. This model has attracted the most attention, for example, the TSB Group has a separate innovation hub based in London, and MetLife launched 'collab' in Europe.

Some have taken on the significant challenge of building agile technology teams and integrating them with the organisation's leadership. Others have set up entire digital divisions with the expectation that those divisions will become the 'business as usual' of the organisation.

The remainder of firms interviewed have focused on bolstering their established IT and tech teams in a more limited approach.

All interview respondents agreed that over the longer-term, technologists will be fed into the wider business, and technical degrees should be seen as feeders for the core of financial services. Across the various models referenced above, there is an aim to avoid silos of tech talent.

The structuring of divisions within banks in the future is also likely to be based around disruptive technology-related functions. For example, due to API reforms, the teams affected are being reshaped around the various interface layers: user, processing and legacy. Firms will move from supply-chain and value-chain structures to become more of an ecosystem.

Many respondents said the aim was to build strong teams with diverse experience. With technology innovation moving so fast it can be difficult to predict what skills will be important. Therefore, it is essential that teams are agile, collaborative and can work cross-functionally, especially when dealing with product development.

One established provider, Visa, decided to go a different way by completely opening their infrastructure to new entrants.

CASE STUDY - Visa

Visa, due to the payments sector being turned on its head and impacted significantly by technology and new entrants, has decided to open up their payments infrastructure to new players and app providers. As part of opening up, Visa has developed showcase space and internet of things (IoT) examples with payment apps, etc. This allows others to take advantage of their trust and security to bring new propositions to consumers and businesses.

It also has the added benefit of setting different expectations in the business as staff are able to see what they are impacting and contributing to. This has gone on to become a tool to attract talent.

Whichever way individual firms have decided to incorporate FinTech into their organisations, all are aware of the difficulties in attracting and retaining the skills required to deliver FinTech ambitions.

Tech employees coming front of house

The adoption of FinTech will create new roles within financial services businesses. Given the relative immaturity of this industry, there is a lack of commonality over language and many of these roles carry different job titles and descriptions. Yet, there is a clear view that in future the distinction between front and back office roles will be heavily blurred. Tech functions will become client facing fee earning roles, and no longer seen as support services.

To help with this process, one established bank has been conducting a programme over the last two years around digital transformation. The purpose of the programme is to help define the workforce of the future and how to bring it into being. They have benchmarked current staff against a new model and created new role profiles.

At the senior level, there will be a need for dedicated figures with both technical and commercial expertise and responsibility for overseeing the interaction between the company's tech employees and their consumers. This requires new skills from senior management and at the very least an understanding of technology and data science.

One respondent has consequently also created the role of Digital Product Manager (DPM). In contrast to traditional product managers who had little if any interface with technologists, the DPM would be responsible for providing guidance on how customer needs and behaviours can lead technical innovations, shaping pricing, programming and implementation to market.

The swap to agile management

Perhaps more significant is the impact of disruptive technologies on the working practices and management of financial services firms. There has been a blurring of lines between IT/tech and business skills, and increased collaboration and cross-functional work, especially in product development. Often this is driven by the vastly reduced timescales which have become standard; previously, product development in financial services was usually three years and now is expected to be 90 days.

From the management perspective, disruptive technologies will enable a shift from linear 'waterfall' management towards more agile working methods. One respondent estimated that in the future, 25% of management would be within top-down management structures, while agile management would quickly become the dominant approach.

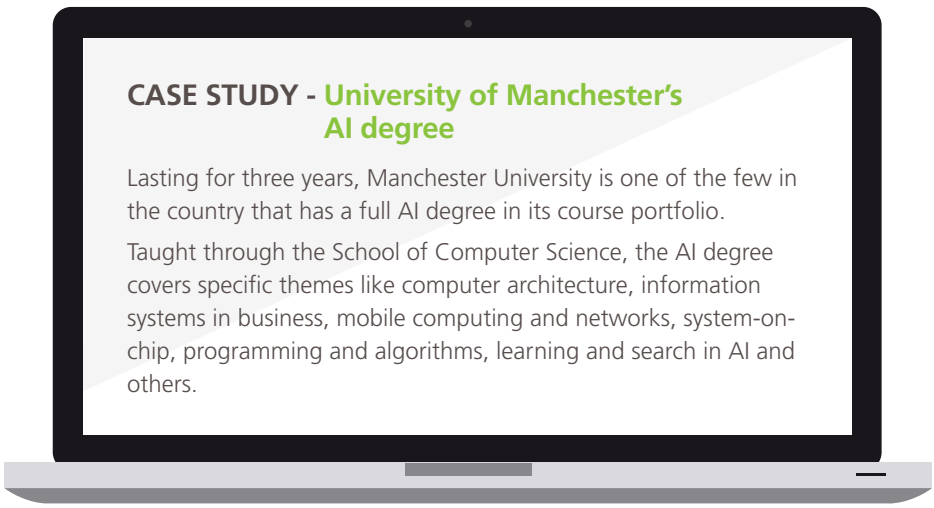
When defining products around user experience, the aim is to make them more personalised optimised and with relevant content. This reinforces the need for agile management, and illustrates how tech changes will be felt throughout the business, as opposed to simply within the tech units.

An Industry which relies on a much wider range of talent

Traditionally, financial services were seen to rely on a small range of undergraduate degrees (finance, maths, accounting etc.) from predominantly Russell Group universities. Going forward, it is clear that this narrow pool of talent cannot meet the future needs of financial services and that a more diverse pool must be drawn upon.

The growth of employees with non-traditional degrees

The changes in tech, and also regulation, requires firms to diversify their intake and their skills base. With regards to those graduates who have undertaken tech-related degrees, and who could potentially be recruited into a tech role/unit of a financial services firm, the concern is often quantity rather than quality. Indeed, those interviewed emphasised that they are satisfied with the quality of technical skill which UK universities produce. Having local access to world leading universities and their graduates is a huge advantage to UK financial services firms.



"The current crop of data scientists and technologists coming out of UK universities and tech sector are among the best in the world. We just need more of them and the drive for more must not compromise quality."

Survey respondent

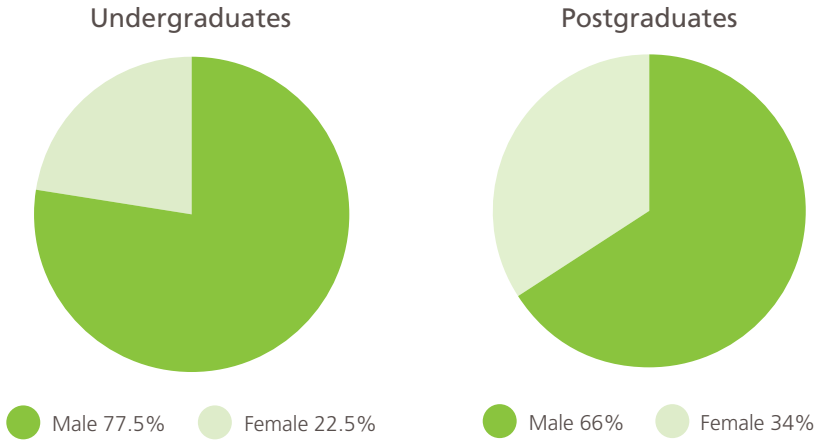
CASE STUDY - University of London's Creative Computing degree

University of London's public research arm Goldsmiths offer a bachelor's degree in creative computing to give students an entry into the software industry.

The course gives undergraduate students skills in designing computer applications as well as using them. Modules include web and applications programming, numerical maths, creative computing practice, digital media, databases networks in the web and others.

There was, however, more concern around the issue of quantity, as highlighted by the figures below on the AI graduate talent pool available. This level of quantity would easily be absorbed by the top tier of UK financial services providers alone.

Figure 1: Gender breakdown of AI talent pool in undergraduate and postgraduate courses
Source: Higher Educations and Schools Authority 2016/17



However, even these numbers do not accurately reflect the availability of talent for UK-based firms. One of the academics engaged in the project highlighted that their university has broadly increased the number of data analyst graduates from 400 to 700 in the last three years. Approximately one half were non-UK students on student visas who would likely have to return to their home countries after graduation. Therefore, these students should not be included in an estimate of the UK talent pool. Also, while it was estimated 200 of the 700 would be highly skilled in AI, the structure of the courses meant this was not clearly defined.

The need for tech literacy across the workforce

The proportion of employees who are required to have deep technical skills, like coding, will continue to be a minority. Yet the skills repercussions of FinTech are certainly not limited to tech experts and will impact the wider workforce. It is therefore important to secure the tech literacy of all employees to ensure they can use the tools upon which FinTech relies.

Any workforce of the future must be able to understand and use associated technologies and systems, especially as machine learning becomes more embedded in the company. Securing this shift will demand a compelling explanation of how these changes are critical to the underlying commercial objectives of the business, particularly for mid-management who were perceived to be particularly resistant to technology changes.

The role of apprentices

To help fill the skills gap more non-graduates with the required skills are likely to be recruited by the financial services industry. Traditionally, financial services firms used to only recruit from universities, so this would represent a significant culture shift within the sector.

Despite financial services firms recognising the benefits of apprenticeship schemes, there was a general view from interviewees that apprenticeships and the Apprenticeship Levy was not being utilised to its full potential, and further thought is required on how it could be used to upskill the IT knowledge of school leavers.

It may be that there is also the potential for apprenticeship schemes to help with the reskilling of existing employees. Specific 'tech apprenticeships' may provide a structured means by which to increase the tech literacy of the workforce, while also helping to demonstrate that apprenticeships are suitable for the professional workplace.

CASE STUDY - KPMG

KPMG has introduced their first Digital Degree Apprenticeship, which is a four-year programme offering on-the-job experience alongside studying for a BSc Degree in Digital and Technology solutions with their training provider.

KPMG believes degree apprenticeships are an example of a vehicle that blends technical and academic education and could be the crown jewel in a revamped technical offering. Students earn as they learn, they do not incur mountains of debt, and they get high-quality jobs at the end.

The firm places the same high-value on their apprentices as they do their graduates. The individuals work, learn and progress together and complement each other through their diverse backgrounds and 'ways of thinking'.

The blurring of boundaries between tech firms and financial providers

In the future, the skills profile of the financial services sector will be much more similar to other sectors. This is already borne out in the fact that many tech recruits come from outside the financial services sector. In the future, we would expect to see much greater 'cross-over' in employees than has traditionally been the case in financial services.

Consequently, financial services firms will have to compete with a much greater range of organisations, including tech firms. However, the sector's reliance on legacy systems and need to maintain traditional services for less tech-orientated customers could dampen its competitive recruitment edge in this wider talent marketplace.

The relative rise of tech roles versus traditional roles

As part of the FinTech revolution, and to bring about the changes mentioned above, it is clear financial service providers will need to recruit a far greater quantity of employees with hard tech skills. Over the last few years, half (51%) of UK recruiters have seen an increase in demand from financial services businesses to hire candidates with AI skills, a 49% increase in demand for cryptocurrency, and 46% for blockchain.[11] This was reflected in the series of interviews, where it was made clear that respondents accepted the need to recruit a far greater quantity of employees with hard tech skills.

The ripple effect of new roles

There is widespread acknowledgement that the impact of FinTech will come in waves as the market matures. Financial services firms are already having to respond and restructure in light of FinTech innovations. In the longer term, it would be expected that firms which provide professional advice in relation to FinTech would have to heighten their own capabilities too.

It was noted that the financial services sector is just one of many sectors increasing its uptake of tech skills, and that the above changes are likely to be replicated across many sectors.

For example, one of our respondents in the legal profession said that technology 'though seen as a necessary evil' was having a profound effect on the profession. Though the focus is still on legal skills over technological prowess, the reality is technology change is already leading to new roles within professional services.

11 LinkedIn, 'Workforce report', (December 2018), available at: https://economicgraph.linkedin.com/resources/linkedin-workforce-report-december-2018

"Five years ago, FinTech was well down the priority order for lawyers. Now it is near the top."

Survey respondent

As with the legal profession, accountancy is also going through significant change. According to a recent global study of professional accountants carried out by ACCA, the spread of digital technologies and their impact on businesses will transform the practice of accounting and the competencies that professional accountants require.[12]

In the period covering the next 10 years, over half of the ACCA global study respondents (55%) identified the development of intelligent automated accounting systems as the factor likely to have the most impact, while 41% highlighted the impact of cloud computing. Smart software and systems will replace manual work (such as bookkeeping), automate complex and multifaceted processes (such as financial close), and support the trends towards outsourcing of some services and repatriation of others.

Across the various sectors, it is therefore anticipated that the creation of new digital and tech related roles will be replicated, bringing greater symmetry across professions.

12 ACCA, 'The robots are coming? Implications for finance shared services', (2015), available at: https://www.accaglobal.com/content/dam/ACCA_Global/Technical/fin/ea-robots-finance-shared-services-0909.pdf

A FUTURE FINTECH SKILLS STRATEGY FOR THE INDUSTRY

Promote the opportunities of FinTech

Quantify tech skill demand

Recommendation - Collect and publish data: there is a need for the industry to collaboratively produce data on the types of skills and numbers of roles projected to be needed over the next five to 10 years. This could then be used when talking to academia and government to create a common understanding of the type and scale of those roles which would be needed. This should be accumulated and published by the Department for Education and Department for Business, Energy and Industrial Strategy, under the joint remit of the Minister of State for Universities, Science, Research and Innovation. Bodies such as the Russell Group which represent universities could provide further analysis on how the demand will be met, flagging any potential gaps.

It is clear from the feedback received from respondents that financial services firms need a greater understanding of their future demand for tech skills. To ensure the data is meaningful, industry must create a common language of roles and skills required.

Leading financial services firms have begun to tackle this issue by carrying out a Strategic Workforce Plan (SWP) to understand which skills and competencies their workforce will require over the next five to 10 years. Once SWPs have been carried out, anonymised data can be gathered to provide a meaningful sample of the industry which will allow feedback of specific supply side requirements to academia and government. The data provided to academia can be used to help create a pipeline of the right skills for the industry.

This raises the need for a transmission mechanism in order to ensure the quantitative exercise by firms as employers is regularly shared at the point where it is able to influence future education and training. It was suggested that the role for collecting data and providing updates to universities should sit under the Minister of State for Universities, Science, Research and Innovation.

Government is the best placed and resourced actor to collect and publish, in anonymised and aggregated form, the SWP employee projections. Bodies such as the Russell Group could assist, particularly in terms of further analysis of the data provided and how it saw existing institutions meeting the corresponding demand and flagging any potential gaps.

Raise tech awareness within senior management

Recommendation - Designate FinTech as an issue for the Board: to boost awareness within senior management of the FinTech skills required, ensure that risks associated with tech, related controls, and desired outcomes are discussed regularly by the whole Board, rather than delegated to the Chief Technology Officer or equivalent figure.

A 2017 PwC report found that there has been a shift in investment to more emerging technologies. In financial services in particular there has been a strong uptake of robotic and cognitive automation (RCA) and AI.[13]

However, despite this investment push, just 23% of executives stated that their leadership team has a clear understanding of AI and how it will impact their end-to-end enterprise. This could present a significant barrier to it maturing as a technology and suggests a lack of preparedness among senior leadership for how AI will impact their workforce.

13 PwC, '20 years inside the mind of the CEO... What's next?', (January 2017), available at: https://www.pwc.com/gx/en/ceo-survey/2017/pwc-ceo-20th-survey-report-2017.pdf

In particular, it was noted by numerous respondents that traditionally Board oversight of tech issues would be delegated to the Chief Technology Officer or an equivalent post, with their recommendations nodded through by the rest of the Board. With tech becoming integral to the wider business, this model of governance will no longer be fit for purpose.

If an individual firm is to succeed in this changing environment, the senior leadership must be able to set out a coherent vision for their embrace of FinTech. This requires executives who are familiar with both the language and uses of FinTech and are, in effect, bilingual in terms of technology and corporate awareness. Industry feedback suggests that training targeted specifically at the Board level is required in advance.

Harness government-led FinTech initiatives

Recommendation - Engage with the public sector: firms should capitalise on the various government led initiatives which have been established in recent years to assist tech literacy. Many of the schemes are seeking a private-sector partner and for engagement from practitioners. In return, firms will be provided with training support and best practice guidance.

A number of individual firms have also developed partnerships and collaborations with enterprises such as the School of Coding, Cyber First and Generation, and with business schools and universities to help reskill their workforces and those that are potentially at a disadvantage in local communities. These are all part of separate government-supported FinTech initiatives which businesses should look to engage with.

More specifically, as part of the AI Sector Deal announced by the government in 2018, an AI Council has been established as a central forum where industry, academia and government leaders can come together to identify opportunities and issues and develop actions to address them.

This Council will be supported by the new Office for AI, a delivery body tasked with implementing the Sector Deal and the government's overarching strategy for AI. Finally, a Centre for Data Ethics and Innovation will be tasked with ensuring safe, ethical and ground-breaking innovation in AI and data-driven technologies. Together, these new institutions will provide the governance and oversight of delivery of the Sector Deal and the wider Grand Challenge.

A comprehensive list of the various initiatives was set out in the government's FinTech Sector Strategy published in 2018:

- a new Advanced Maths Premium Fund to help schools and colleges increase the number of students studying maths after GCSE
- a new Computing Curriculum, launched in September 2014
- the introduction of new T-Levels, of which the Digital T-Level will be one of the first, rolled out in 2020
- the launch a new Institute for Coding
- the creation of a Digital Skills Partnership, announced in the Digital Strategy, that brings together national and local organisations
- commissioning the FinTech Delivery Panel, launched by HM Treasury, to establish a 'Connect with Work Programme' to find and recruit individuals for FinTech companies.

There are also initiatives at the international level which could help drive FinTech adoption. One example is the DQ Institute, a public-private-civic-academic coalition in association with the World Economic Forum, with responsibility for enhancing the quality of digital

intelligence education. The coalition provides evidence-based solutions and data-driven policy recommendations to help individual nations build ethical digital ecosystems through multi-stakeholder collaboration.

Establish a dialogue with universities

Partner with universities to ensure a pipeline of tech talent

Recommendation - Formalise and embed work placement schemes within university degrees: to ensure applicability of tech talent within the business, financial and related professional services firms have developed bilateral relationships with individual firms and specific universities that have enabled them to establish their own placement schemes. However, though beneficial for the individual firm and the graduate, these are relatively small scale and will not address the broader industry challenges outlined in this report.

The Financial Services Skills Taskforce, announced by the Chancellor and chaired by former City Minister Mark Hoban, in conjunction with TheCityUK, is investigating the pre-conditions that enable successful industry-wide placement schemes in the pharmaceutical, engineering and medical sectors and considering whether such an industry-wide scheme could be developed for the financial services sector.

Financial services firms do already have many links to universities. These relationships are varied with an acknowledgement that personal connections remain key, with most schemes originating through alumni. A more formalised scheme could help, recognising that a small number of big financial services firms currently dominate campus recruitment.

Academies and business schools are also increasingly seen as a proven means of addressing particular skills shortages through joint degrees with industry. A number of these have been developed by established firms in conjunction with a university partner. It was acknowledged industry demand will be the fundamental driver.

Such schemes could additionally help to foster many of the softer skills which have been found to be critical for the future of the industry profile, for example, around entrepreneurial drive and being innovation friendly.

A consistent finding was that universities need to become more career focused and view themselves as a recruitment channel. That shift in outlook would, it was felt, address many of the issues flagged with the workplace skills of graduates from UK universities.

Undergraduate: using industrial placements

It was proposed that a critical way in which to bridge the gap between academia and industry is the adoption of formally-recognised placement schemes. Across the graduate spectrum, there was support for programmes which incorporated industry placements and a view that this should not be limited to non-traditional degrees/institutions (or viewed as vocational).

The main aim of an industrial placement would be to put theory learnt as part of the course into a business context and to learn work-based skills. Companies who offer a placement year generally provide structured training, so students are able to finish the year having learned a great deal and developed new skills. Many companies also use industrial placement schemes as a way of identifying future talent, often inviting students who perform well on their placement to join their graduate entry scheme.

A number of financial services firms have long established schemes for industrial placements, particularly in areas such as investment banking where the quality and structure of these schemes is considered to be variable at best. Within financial services there is also no specific industrial placement scheme for FinTech, which given the need already outlined in this report for new technology skills and more commercially aware graduates in the sector, seems to be a missed opportunity that should be rectified. FinTech industrial placements could work for both large and small financial service firms.

CASE STUDY - Ancon Technologies

Ancon is a high-tech company offering new molecular detection technology providing solutions to industries such as military, security and defence.

Following an online application and interview, interns are offered the opportunity to apply some of their degree skills and make a significant contribution while working fairly independently with a fascinating technology.

Interns work at the centre of the action performing experimental research relating to Ancon's core proprietary technology and get involved in testing different modules for use in Ancon's main device, analysing their suitability against alternatives and optimising the systems for the specific uses of the desired applications, as well as calibrating certain sensors for reliable use with the technology. Some of the work conducted by interns is for clients, therefore the quality has to be high.

During the placement, interns learn crucial laboratory skills including how to design experiments to be as efficient as possible in a time constrained environment, gain expertise with various pieces of equipment used within the aerosol science field and the ability to work independently but with guidance when needed.

Postgraduate: enabling access to FinTech trials and pilots

It was also noted by a number of respondents that many firms have failed to incorporate postgraduates within existing FinTech related schemes and initiatives. For example, many firms have established hackathons as a time-limited development event, where financial providers present a business or technology challenge and invite FinTech start-ups and entrepreneurs to come up with a solution, often through a team that has formed specifically for the project.

Popularised in recent years by several high-profile success stories, hackathons focus on rapid innovation and fast prototyping to test early-stage concepts, rather than producing a polished product. As part of the exercise, teams participating in the project are often given access to internal expertise and resources by the provider and can potentially gain intellectual property rights.

It was noted that to date the vast majority of firms engaged in this model of FinTech innovation had missed an opportunity by failing to invite relevant postgraduates to participate in the programmes. Not only would this generate further ideas and creativity, but it would assist the talent pipeline challenge by providing postgraduates with first-hand experience of working in a financial services provider, and potentially even open doors to future employment with the firm in question.

Incorporate tech literacy into all graduate degrees

Recommendation - Universities should increase tech content in non-tech course: as tech skills are required in a range of roles across all sectors, our research has indicated a clear demand from employers to increase the numeracy and tech literacy of students across a whole range of non-tech degrees. Universities should therefore work with government and business to develop initiatives to increase the tech content in non-tech degrees.

It was suggested by a high proportion of respondents that in order to be attractive to employers, even those graduates studying traditional degree courses should be required to take additional tech modules to ensure that they have the level of technical literacy required for the modern workplace.

This shift would also address the pervading finding that firms struggle to apply graduate talent within their firm. Respondents often stressed that with graduates in traditional roles, technical literacy should be seen in the same light as commercial awareness. A leading example is how Imperial College University have modularised significant amounts of undergraduate content, including on coding, data analytics and AI, to enable easier incorporation in other courses. Particularly with regards to data specialists, it was flagged that when recruiting individuals, it will be important to take a balanced approach. On one hand, it is necessary for tech recruits to come from an entrepreneurial or start-up background with plenty of innovative ideas, but this needs to be countered with roughly the same proportion of tech people drawn from a high-volume transactional environment.

Use academia to reskill the current workforce

Recommendation - Government and universities should work together on reskilling: given it is beneficial to the economy as a whole for the UK's workforce to constantly update its skills to fit businesses requirements for the future, the government should provide funding to universities and Further Education institutions to ensure support is provided to business on reskilling.

According to a 2017 Deloitte survey, digital skills continue to be in short supply with just 16% of executives believing that their current talent pool has enough knowledge and expertise to execute their strategy and over 75% experiencing challenges in recruiting employees with relevant digital skills.[14]

Slightly surprisingly, the survey also indicates many senior executives lack confidence in their own digital skills and their ability to develop these as well as their ability to lead their organisation in the digital economy.

With skills in short supply, organisations increasingly need to focus on developing talent from within by aligning learning and development (L&D) to their digital strategy. Sixty-eight per cent of executives surveyed said they would prioritise developing their existing employees' skills to strengthen their organisation's digital capabilities. Yet when asked about L&D, 54% state that their curriculum does not support their digital strategy.[15]

The reskilling challenge facing companies within the traditional parts of the business is substantial. Some firms have estimated 60% of their workforces will be impacted by capability reviews connected with the FinTech and digital agenda. For some, it had been estimated that a sixth would have to reskilled to an advanced level.

Many firms already run reskilling programmes or schemes as part of continuous learning. In the field of FinTech, where technologies can quickly become out of date, this will be an essential way forward. Respondents to this survey have a general view that the role for universities in this space is underdeveloped. It was suggested that reskilling schemes should be focused around employee life cycle events, for example employees returning to work after an extended absence, internal progression, or during re-structuring of a firm, as an alternative to redundancy.

Interestingly, respondents also stressed such reskilling must be centred not just on hard tech skills but also how to manage people, time and clients. This is likely to be in response to factors such as the move in the workplace from hierarchies to networks, the rise of collaboration and partnership working, the need to offer high-calibre advice to non-technical boards and demonstrate technology in business terms, not jargon.

14 Deloitte, The impact of the digital age on global mobility 2017, Global Workforce Trends, 2017
15 Ibid.

CASE STUDY - AVIVA PLC

As an international business which has grown through acquisition, Aviva has historically had pockets of data scientists all working locally with their own systems and processes. To help build data science best practice across the organisation, Aviva brought its data scientists together into an internal community of practice called Quantum, and is currently creating its online learning platform.

The platform will provide a learning pathway for data scientists and – in addition to helping existing data scientists build their skills – can offer a route into data science for other staff. The focus is not just on technical skills, but also on commercial and influencing skills. This reflects their belief that data science is about extracting the benefit out of data, and this requires not just technical skills but softer skills such as negotiating, communication and commercial awareness.

Aviva is about to announce a partnership with the University of Cambridge. It is their experience that universities are seeking real world problems to solve as a way in which to test and update their teaching and training.

Boost the reputation of the financial and related professional services industry

Financial and related professional services continue to provide those in the industry with a dynamic and rewarding career. The quality of that work will continue to be one of its biggest attractions.

The financial and related professional services industry is a key national asset employing 2.3 million people across the UK, two thirds of whom are employed outside London.[16] It is also a relatively young industry, offering at least 10,000 graduate level entry roles annually, and increasingly recruiting through alternative routes such as school leavers and apprentices. Accountancy is a particular clear example, with leading firms having an average age of between 27 and 28.[17]

Yet, the image of the industry has suffered in recent years. It is seen to be a more conservative, risk-averse sector. In contrast, many graduates with tech skills are looking for innovative and transformative places of employment.

16 TheCityUK, `Key facts about UK-based financial and related professional services, (April 2018), available at: https:// www.thecityuk.com/assets/2018/Reports-PDF/38f60d8b7d/UK-key-facts-about-UK-based-financial-services.pdf

17 ACCA, 'The robots are coming? Implications for finance shared services', (2015), available at: https://www.accaglobal.com/content/dam/ACCA_Global/Technical/fin/ea-robots-finance-shared-services-0909.pdf

"Generally, most talent seeks companies that demonstrate they can move and change – are agile – which can be difficult for monolithic companies in London."
Survey respondent

A majority of respondents to the survey felt there was no doubt that the reputation of financial services following various mis-selling scandals and the financial crisis had made it more difficult to recruit skilled graduates. It was felt other sectors may be considered to be more exciting to graduates with computer science degrees.

"The regulated and bureaucratic nature of financial services is a big disincentive to tech skilled employees, who can easily jump into other industries in a way that is not possible for traditionally skilled employees."
Survey respondent

A number of respondents acknowledged the perceived conservatism of the industry was off-putting to potential candidates and a factor behind 'tissue rejection' (the departure of the employee from the firm after a short period of time).

According to the LinkedIn Workforce Data and based on UK recruiters' and hiring managers' conversations with candidates, the following types of financial service organisations have grown most in terms of appeal to candidates over the last five years:

- cryptocurrency businesses
- investment funds
- newer challenger banks
- FinTech.

Based on their conversations with candidates, traditional banks are now less attractive to candidates according to 32% of UK recruiters and hiring managers, rising to 36% in London.

Among our respondents there was a range of views as to whether financial services are still seen as a good place to work. One respondent believes finance has taken a big blow in terms of attracting graduates in the last 10 years, trying to compete with tech companies.

"The industry needs to redefine the value to prospective employees. It used to be about earning more. Now it should be about making a difference."
Survey respondent

However, one respondent made the point they are able to attract graduates via corporate social responsibility and other schemes, such as charities and social awareness programmes, for example, work with Young Enterprise, Habitat for Humanity. Some firms have meanwhile made a big effort to provide an appealing working environment for those with digital skills (open work spaces, informal dress codes etc.).

It is clear that targeted action on boosting the reputation of the industry is needed if firms are to attract in future highly mobile tech talent.

Engage with schools on careers advice

Recommendation - Careers advisors should promote financial services: respondents to this survey were clear more needed to be done to promote the industry in schools and Further Education institutes. Industry ambassadors should break down the narrow perception of employment in financial services, and bring to life the breadth and depth of skills and roles on offer.

Those interviewed for this report had fairly strong views on what more academia could do to help provide businesses with the talent it requires. Across the board, it was felt that school education could do more to promote and excite students as to the possibilities of a career in financial services and the role which tech will play in the future. Failure to do so would naturally contribute to fewer students wishing to take science, technology, engineering and mathematics (STEM) subjects at A Level, which would inevitably have a direct impact on both the number and diversity of undergraduates pursuing courses that are relevant to FinTech related employment. In particular there was a perception that a lack of advice at GCSE Level was a contributing factor in the fall in female students at A Level pursuing STEM subjects.

One of the participants disclosed that they were involved in a newly-established scheme whereby school pupils where given the opportunity to shadow a CEO for a day. This could be expanded. Across academia, at university and school level, it was also felt there is a need for careers advice to become broader and for the opportunities of financial services to be promoted outside STEM subjects, and at non-Russell Group universities. A lot of financial services firms are consciously looking to broaden their intake beyond Russell Group universities, recognising that many other universities can excel at providing both more niche skill sets and also innovative graduates who are more willing to embrace change.

More broadly initiatives such as that launched by Innovate Finance in March 2019 will be key; 'FinTech for Schools' aims to support a future domestic pipeline of talent by encouraging young people to understand the increasing importance of digital skills in the workplace, with an emphasis on ensuring the sector is appealing to girls. It targets in particular secondary school students to inspire them as they make the decision on whether to go to university or pursue a more specialised further education such as an apprenticeship.

Compete with Google

Recommendation - The industry needs to cast its net wider to attract talent: financial services organisations must set out strategies for attracting tech talent from other sectors and industries.

One potential angle to attract talent was mentioned by an insurance group:

> "If you go to Google as a software developer, you are one of many. If you come to insurance or financial services, there is a real opportunity to shape new trends, be a key person, stand out, gain exposure and have an excellent career path."
>
> Survey respondent

Some respondents saw different ways of working as a way to compete with the tech firms.

> "Allow smaller teams to have more autonomy. Accept things can go wrong, learn from it. Encourage teams to work in a different way. Foster agile development."
>
> Survey respondent

Another respondent in the insurance sector felt that in order to communicate how the industry is undergoing real change and the opportunity to "come and make a bigger impact here", senior executives needed to widen the types of platforms they interacted with.

It was also suggested there remains a key problem around retaining the right people. Work culture and working practices are pivotal in this regard. One of the respondents agreed that culture and environment are crucial in attracting the right talent "to us, and not to Facebook, Google etc".

Increase diversity

Recommendation - Promote diversity: diversity continues to be a significant issue within financial services. Given the current imbalance between the number of males and females studying tech degrees, this issue will only become exacerbated over time without specific attention. One example from which to learn is the Women in Engineering initiative that has promoted greater diversity in that particular industry.

Diversity in executive leadership of organisations drives improved financial performance. Research from McKinsey & Company shows that companies in the top quartile for gender or ethnic diversity are more likely to have financial returns above their national industry medians.[18] Similarly, EY's Centre for Board Matters, identifying investors' top priorities for companies in 2018, revealed that 'board composition' with a particular focus on 'enhanced diversity' was the first priority for 82% of respondents based on research with 60 institutional investors.

If we ignore or fail to recruit and inspire our best talent, then the UK will be less successful. However, as reported in the Financial Times in 2016, "moving towards a more ethnically diverse workforce is usually a triumph of hope over experience. Companies say they want this. Many have diversity officers and schemes in place but still struggle to recruit."[19] Creating a culture of inclusivity and a pipeline of diverse talent at the bottom of an organisation is no guarantee of a diverse and successful boardroom. However, a lack of that pipeline is almost guaranteed to stop it from becoming a reality.

The rise of FinTech may however add to the lack of diversity and particularly the gender imbalance, given the difference in the number of male and female graduates in certain tech courses.

18 McKinsey & Company, 'Delivering through Diversity', (January 2018), available at: https://www.mckinsey.com/~/media/mckinsey/business%20functions/organization/our%20insights/delivering%20through%20diversity/delivering-through-diversity_full-report.ashx

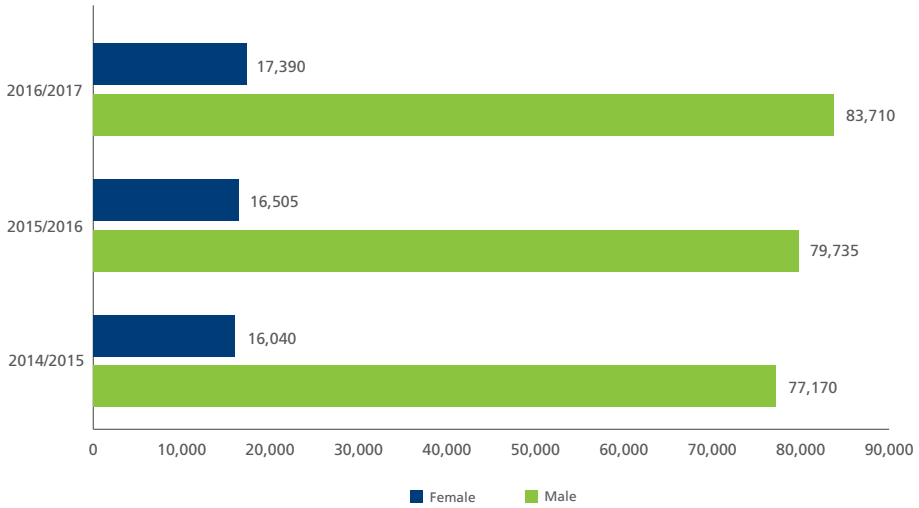
19 Financial Times, 'Be careful how you play the blame game when recruiting', (26 May 2016), available at: https://www.ft.com/content/64e0e36c-1dc9-11e6-a7bc-ee846770ec15

Science, technology, engineering and mathematics stats at school level

In 2018 girls received just 43% of A Levels awarded in STEM subjects. This is not the case for all STEM subjects: girls are just as likely as boys to take chemistry, and more likely to take biology. The most striking gaps are in physics and maths: girls accounted for 39% of this year's maths A Levels, 28% of further maths A Levels, and just 22% of all physics A Levels. Figure 2 highlights how the talent pipeline is male dominated.[20]

Figure 2: Computer science graduates trends

Source: Higher Education Student Statistics



This lack of diversity in the pipeline of talent was highlighted by respondents who felt it was dominated by male engineers and developers, with little visibility of female talent coming through. In response to these issues, HSBC are developing 'The Talent Story' which details how the firm is looking to encourage the number of women in its workforce. This has included engagement with women's groups to establish a reputation as a good place for females to work.

To help improve this situation, financial services could look at other relevant sectors for ideas on how they have worked to improve gender diversity.

For example, the Women in Engineering (WIE) campaign was set up to support greater gender diversity in the engineering sector and various initiatives are supported by government, businesses and academia, the Institute of Engineering and Technology (IET) and Society of Women Engineers.[21]

The campaign was set up following research in 2014 suggesting that although 20% of engineering school graduates are women, one in four female engineers leave the field after the age of 30, compared to only one in 10 male engineers. Just 6% of the engineering workforce was female.

Research carried out for the campaign found only 7% of parents felt engineering would appeal to their daughters as a career. For financial services to manage its skills gap over the next three to five years, it is essential that more women are recruited and retained into the industry.

20 Higher Education Student Statistics, 'UK, 2016/17 - Subjects studied', (January 2018), available at: https://www.hesa.ac.uk/news/11-01-2018/sfr247-higher-education-student-statistics/subjects

21 Jaguar Land Rover, 'Women in Engineering', (March 2019), available at: https://www.jaguarlandrover.com/node/15176

Firms should either establish their own diversity initiatives or support ongoing schemes, recognising that diversity is not just about gender. For example TheCityUK has ran a series of events on diversity and inclusion (D&I) in 2019 to discuss D&I challenges and best practice. D&I is also a core pillar of the Chancellor's Financial Services Skills Task Force, chaired by Mark Hoban and convened by TheCityUK, which has been launched by government to assess the future skills challenges facing financial services.

CASE STUDY - Jaguar Land Rover Women in Engineering Sponsorship Scheme

Jaguar Land Rover (JLR) has put in place a number of initiatives to positively influence the number of female graduate engineers pursuing a career in engineering upon graduation. In 2013 there were only 1,234 female students who graduated from 'appropriate' engineering subjects in the UK. Of an already small number, three out of 10 then choose not to go into engineering careers meaning that many leave the profession before they have even started.

JLR created the Women in Engineering Sponsorship Scheme - a unique scheme to support the training of female engineers alongside their degree. The scheme offers three, six and 15 month placements to female students studying engineering.

Each placement student is matched with a mentor in the business from day one all the way, lasting through their placement and when they return to university. The mentor is considered to be particularly valuable when a student enters a role as this can seem a daunting environment and the contact helps to ensure their inclusion.

The results are encouraging for JLR. Through the initiative nearly a quarter of their graduate engineering hires are now female, a significant increase on the proportion prior to the operation of the scheme.

CONCLUSION

People adapt to technology quicker than business, and business tends to adapt quicker than public policy. Financial services is going through a revolution driven by FinTech, increased customer expectations and regulatory requirements. For financial services to survive this changing landscape and remain at the heart of the UK economy, all of the stakeholders involved will need to adapt.

With technology being so critical to front, mid and back office functions, people need to be ready to adapt and update their skill-sets, being prepared for life-long learning of new skills. Although this report is focused on the next three to five years, the requirement for more people with data analytics, data science, behavioural science, product design, AI and AR skills and experience is unlikely to reduce in the longer term.

Measuring the future demand for the above roles will be critical if the UK is to provide, through its universities and learning institutions, a sufficient supply of skills. Currently the scarcity of data risks creating a longer term shortage which would damage UK competitiveness.

Businesses within the financial and related professional services industry must meanwhile adapt to provide the personalised customer experiences that so many of their customers, clients and particularly millennials crave. Emerging technologies like AI offer solutions to meet heightened expectations. However, many firms are still falling short. To adapt, firms must become more agile and technology responsive, and senior management must empower their workforces by providing them with the tools and the space to learn the new skills that are required and highlighted in this report. Senior leadership should themselves be tech aware.

Financial services businesses must additionally be willing to change culturally by being more diverse, particularly in their recruitment, casting a wider net, looking beyond the usual Russell Group universities and ensure more formal links are made with universities. These should incorporate initiatives to encourage greater diversity, creating a more entrepreneurial industry where decisions can be made quickly and at the 'appropriate lowest possible level'. And such initiatives must not stop with universities but reach through into schools to ensure an earlier understanding of the careers which are possible, and longer term foster a more visible pathway from early learning to the workplace.

Finally, it is clear from respondents that they believe the reputation of the industry is tarnished in the eyes of the wider public and that this is making it more difficult to recruit. Therefore, the industry needs to redefine its value to prospective employees. Financial reward may no longer be the biggest determinant in recruiting the best.

Government, academia and public policy must also adapt. Respondents to this survey frequently highlighted that if FinTech was to continue to flourish there is significant need for a greater quantity of graduates and non-graduates with not just hard-tech skills but more rounded skills such as creativity, empathy and collaborative working. These skills must be taught and learnt as early as primary school level.

Government should also work with industry to ensure academia has the right resources available and the ability to support businesses in the task of reskilling their workforces and preparing them for the future.

The UK has established a leading role on FinTech, with many of its achievements replicated in markets across the globe. Securing a pipeline of future tech talent for financial services, as outlined in this report, would ensure that the UK is equipped to remain at the forefront of international competition in the decades to come.

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