NFER
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The Hg Foundation

A narrowing pipeline?

What changes in UK tech hiring might tell us about future opportunities in the sector

Contents

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Foreword

As a Foundation with a mission to widen access to careers in tech, it's crucial we understand the talent pipeline into the sector, where the leakages are and how that might be changing, so that our work stands the maximum chance of making a difference to the groups we care about. Critically, we want to ensure that the partnerships we support are preparing learners as best they possibly can for the future workplace. We have commissioned this research programme from NFER to help us look at these issues and to inform our future priorities as a grant maker – and, where relevant, we want to share the findings with the sector, so we can move forward together with the best evidence and insight.

The findings of this first output from NFER has given us pause for thought. Whilst careers in tech no doubt continue to offer many routes to social mobility, the picture is far more nuanced than it has been in the past: tech is no longer synonymous with jobs growth; some skills that were highly valued five years ago are becoming less so; and employers seem to be looking for a new cadre of specialist skills as well as seeking candidates with a more flexible skillset to cope with uncertainty. Some of the findings are stark: for example, that there are half as many jobs in core tech roles as there was in 2016/17; that the decline has been particularly steep since the pandemic; and that it has especially impacted entry level roles. The pace of change is also remarkable: it seems highly unlikely that the jobs young people are going into now will be the same as those they will be competing for in one year's time, let alone five.

However, we firmly believe that the Foundation's mission remains relevant and important. In an increasingly complex space, it is even more crucial that we direct those who already face barriers to accessing tech careers to the parts of the sector that are most promising in terms of future opportunity. We must help them to build the skills and attributes that they will need to thrive, where adaptability and flexibility will likely be even more important. And even if some areas of tech are static (or shrinking) it is still important to harness the best people for those jobs, regardless of their background.

We need your help to make sure we meet these challenges head on. We are publishing these initial findings now because we want as many views as we can on whether what we have found resonates and, critically, what the future outlook might be. Combined with the next stage of the analysis – which includes focus groups and a survey that NFER will be undertaking over the next few months – it will help us ensure our work continues to provide transformational opportunities to those from underrepresented backgrounds.

James Turner
CEO of The Hg Foundation

31%
less live adverts

50%
less advert volumes in ‘core tech’ roles

68%
decline in programming roles in 2024/25 compared to 2019/20

Executive Summary

This report looks at data about the number and nature of online job adverts for tech roles in the UK since 2016.

The number of UK job adverts across all sectors has declined sharply since early 2022. Between 2016 and 2020, the number of UK job adverts overall declined slowly, and then rapidly during the pandemic. Following a post-pandemic recovery, there are now 31% fewer live adverts (on average) in 2024/25[1] compared to 2019/20 pre-pandemic.

This slowdown has been faster in tech, particularly ‘core tech’ occupations like software development and IT, than it has been in other occupations. In 2024/25, ‘core tech’ advert volumes are now 50% lower than the level before the pandemic in 2019/20.

This has been driven mainly by a steep decline in software development opportunities post pandemic. For example, the average number of live adverts for programming roles, which was at 42,000 in 2019/20, fell to 14,000 in 2024/25, a decline of 68%.

This appears to have led to an unprecedented 10% decline in the number of people employed as software developers between early 2023 and 2024.

‘Tech adjacent’ jobs in areas like engineering and natural science have fared better than ‘core tech’ occupations.

Adverts for ‘tech adjacent’ roles have also declined, but the decline is much smaller, with volumes only 26% lower in 2024/25 compared to 2019/20.

The large fall in UK job adverts since 2022 is closely linked to economic challenges including rising inflation and high interest rates, but initial work suggests other factors in tech are also at play.

The decline in demand for ‘core tech’ roles is not limited to the UK; adverts for software development roles in countries like the USA have declined sharply since 2022 too.

International competition and AI may may be partly driving these trends. We heard suggestions from workers in the tech sector that many UK ‘core tech’ jobs being relocated to other countries, but this is hard to trace in data. Our future research will focus on this, as well as the emerging impact of Artificial Intelligence (AI), which may also have affected adverts, especially in the last 12 months.

Entry-level tech roles have been particularly affected, with demand for talent more focussed at the mid and senior levels. There are now four times as many adverts for senior than junior programming roles. This raises serious challenges for younger people seeking entry to employment in tech.

The nature of tech jobs and the skills required is also changing fast. Software development skills are emphasised much less in job adverts than they have previously. Whereas general skills like project management, as well as some specific technological skills such as data science, have grown in importance.

Our research has also found that employers are listing qualification requirements more often for tech roles. Across the adverts that listed a qualification requirement in 2024/25, 47% of tech roles required a degree or equivalent, compared to 32% of non-tech roles. This could suggest employers are becoming more selective, although it may also be driven by changes in the nature of roles.

We want to collect your views. This report contains various comments from workers in tech and we want to gather more. You can fill in our survey here. We will share findings from this survey and future research throughout 2025.

[1] This report primarily looks at data across financial years. 2024/25 averages are year-to-date, covering the period between April 2024 and November 2024. This is justified given we use an average rather than a total and there is limited seasonality in the data. See methodology for more details.

Table 1: Changes in average live postings and changes for key occupational groups

	Average Live Postings			Percentage Change	
Occupations	2016/17	2019/20	2024/25*	16/17–19/20	19/20–24/25
All Jobs *All adverts on the Adzuna data platform.*	**1,111,000**	**949,000**	**657,000**	**-15%**	**-31%**
Tech *Tech includes many different occupations, including roles in IT, engineering, science and analysis. Some technician and operator roles are also included.*	**130,000**	**123,000**	**62,000**	**-5%**	**-50%**
Core Tech *This is a subgroup within Tech. It includes occupations that work in IT, including programmers and IT project managers. It also includes web designers and data analysts.*	**86,000**	**83,000**	**33,000**	**-3%**	**-61%**
Tech Adjacent *This subgroup includes all occupations in Tech that are not in the Core Tech subgroup.*	**44,000**	**40,000**	**29,000**	**-10%**	**-26%**
Programmers *This refers to a specific category in the occupational classification, Programmers and Software Development Professionals. This category is included in the Tech and Core Tech groups.*	**41,000**	**42,000**	**14,000**	**+2%**	**-68%**

Source: NFER analysis of Adzuna data. 2024/25 does not include a full year of data. See methodology.

Introduction

Technology, and jobs in technology, has fuelled growth and productivity, improved individuals' incomes and provided wider economic benefits. They are set to play a key part in the UK's emerging, modern industrial strategy for economic growth over the next decade (*Department for Business & Trade, 2024*). The tech sector has also offered individuals well-paying jobs: in recent data, students who study tech subjects earned more after graduating than other students (*Engineering UK, 2024*).

In the UK, there has been significant growth in the number of workers in tech occupations. A 2022 report showed five million people work in the digital tech economy, up from around two million in 2011 (*Tech Nation, 2022*). But the skills supply has lagged behind, leading to widespread employer-reported skills shortages. In 2017, the digital skills gap was estimated to cost the UK £63 billion per year (*Science and Technology Committee, 2016*). But some groups – especially women and girls, those from certain ethnic communities and lower socioeconomic background – have less of a chance of accessing tech-related jobs (*Tech Talent Charter, 2024*).

This underpins the mission of The Hg Foundation, which works to build the talent pipeline into tech sectors and to ensure that everyone has the opportunity to work in tech, regardless of background (*The Hg Foundation, 2024*). To help inform its strategy, The Hg Foundation recently commissioned NFER to produce evidence on the pipeline of workers into tech occupations in the UK.

This is the first report in that research programme. It highlights very recent data which suggests the pipeline for tech jobs in the UK is changing significantly. Adzuna data, which captures 95% of job adverts in this country, shows the number of adverts for tech occupations fell by more than 50% between 2016/17 and 2024/25. Whilst job listings have declined in the wider economy in that time, tech occupations have fallen further than others. This does not mean there are no areas of growing demand within tech sectors, but these are masked by the overall trend of decline. We assess those trends, as well as how skills and qualifications requirements in job adverts have changed over time.

We also offer possible explanations of why this change has happened. Some factors, such as cost inflation and high interest rates, are likely to pass eventually. Others, such as rising international competition and the emerging force of AI, are more permanent shifts. If these factors account for most of the recent data, they have significant implications for the talent pipeline into tech roles, particularly for young people searching for entry-level roles. They have important implications for the tech industry, policy makers, education providers and young people.

At this stage, this analysis should be treated cautiously. Whilst important, the volume of job adverts is only one measure of the health of the labour market. It is not possible to determine which of the factors discussed has had the largest effect on the data, and therefore what is likely to happen in future. Consequently, in the next phase of the programme we will be gathering many more perspectives from tech employers on these findings. This will deepen our understanding of the trends, their causes and consequences, and the future outlook.

Beyond this, our **wider research agenda** will also explore access to jobs in tech in the recent educational and labour market data. We will look at how access to tech-related qualifications is changing over time, as well as the pathways those currently in the sector have followed. If the pipeline has narrowed, then this work will be even more vital in ensuring everyone has fair access to these jobs in future.

As outlined in the Executive Summary, we want your view on the findings presented in this report. Please respond here.

Methodology and Data

This report utilises job advertisement data from Adzuna, who gather data on around 95% of online job adverts from over 1000 sources. Adzuna parse the text in these adverts and code the text to skills and qualifications taxonomies. We looked at all data available at the time of analysis, between April 2016 and December 2024. The analysis focused on examining changes in the volume of adverts for roles in tech occupations, and qualifications mentions and skills mentions in these job adverts. We reviewed trends over time in the volume of job adverts by occupation and in the relative importance of qualifications and skills mentions across qualification levels and 350 different skill groups.

To understand trends across different types of jobs, we broke the data down by occupation by using the Standard Occupational Classification (SOC) 2020 system. Our focus is on technology jobs. Building on existing approaches (*e.g., DfE, 2024*) we identified occupations listed in the SOC system that can be described as 'tech occupations', which are listed in the Annex. To deepen our understanding of trends in the data for tech occupations, we further classified tech roles into 'core tech' occupations and 'tech adjacent' occupations. For example, software developers and IT professionals were classified as a 'core tech' occupation, whereas scientists were treated as being 'tech adjacent'. A small number of adverts do not have an occupation attached to them. Due to system limitations, these are counted as adverts for 'non tech' occupations (*except in the work on qualifications, where they are omitted*). The full classification is listed in the Annex.

The Adzuna data covers most job adverts in the UK and is a rich source of data about the adverts. However, not all job vacancies or openings are advertised online. For example, some firms will prefer to make personal approaches to individuals they are seeking to recruit, or use a headhunter. We need to bear in mind that these jobs may be systematically different to those listed online.

We did not have data for the full financial year 2024/25 when preparing this report. We report 2024/25 averages on a year-to-date basis. It is theoretically possible seasonality could skew this average, but our analysis suggests seasonality is limited in our main data series – see the Annex for more details. Similarly, we use 2019/20 averages as a pre-pandemic measure. Whilst early 2020 data could have been mildly impacted by the emergence of Covid-19, this is likely to only make a small difference to the average for the full 2019/20 financial year.

To validate the trends we identify in our data from Adzuna , we cross-reference them against other sources. In particular, we looked at recent ONS analysis (*which also uses Adzuna data*), as well as job vacancy statistics (*that use a different data source to Adzuna*), numbers about employment in tech occupations, and evidence from other job advert websites about UK and international trends. Relevant comparisons are made throughout the report and in the Annex.

Verbatims – Throughout this report, we quote people who currently work in the tech workforce, or recruit for such occupations, in the UK. These verbatims are initial views, only intended to illustrate potential explanations for the patterns in our data. Respondents were recruited by The Hg Foundation or NFER. They are not gathered from a representative sample.

In the next phase of this research programme, we will be collecting views from a representative sample of senior leaders and hiring managers within tech sectors, including on explanations for the trends and patterns reported in this paper. We will also analyse data on educational pathways for different groups into the tech workforce. This analysis will be released in future reports.

Section 1:
Job Advert Volumes

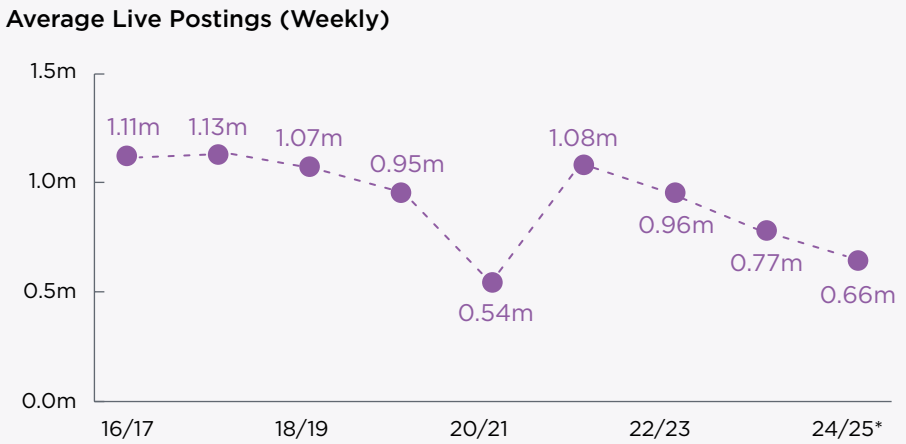
The number of UK job adverts has been declining for almost ten years. Tech-related roles have seen a big slowdown, especially since an initial post- pandemic recovery.

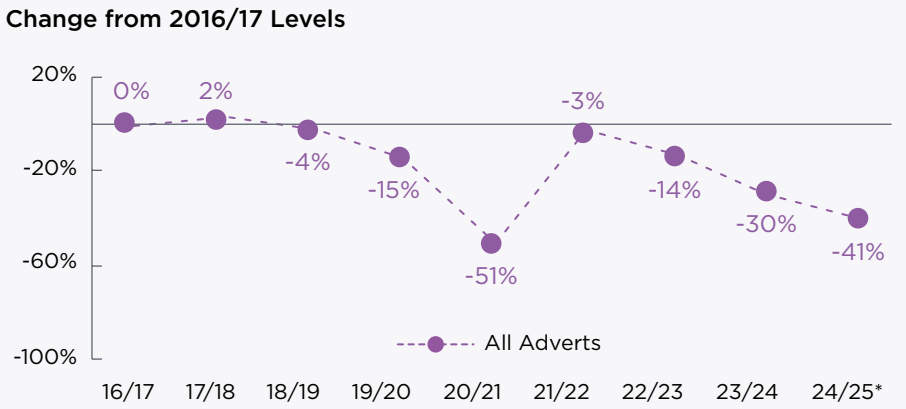
Job advertisement data from Adzuna in Figure 1 shows that there has been a considerable slowdown in the total number of jobs advertised, in both technology occupations and other occupations. Before the pandemic, volumes were relatively flat year-on-year but fell from 2018/19 into 2019/20. In 2020/21, volumes dropped massively but then recovered the following year. Since 2021/22, the volume of adverts has been on a relatively consistent and steep downward trend.

Overall, this indicates a decline in employer's appetite to recruit staff dating back at least as far as 2017/18. This is likely to be in part because the UK has experienced relatively slow growth since 2016, and almost no growth since the start of 2022 (*Harari, 2024*). In recent years, inflation and interest rates have been high, curtailing investment. Businesses have been more reluctant to ramp up recruitment in such an environment. Indeed, other data sources show similar trends. For example, official statistics also show a decline in UK vacancies since around April 2022 (*ONS, 2025b*).

Figure 2 shows how adverts for tech occupations have fared against adverts for other occupations. Between 2016/17 and 2021/22, adverts for tech roles did as well as, if not slightly better than, adverts for other roles. However, since 2021/22, tech roles adverts have declined by more than adverts for other roles. **In 2021/22, there was a weekly average of around 126,000 adverts for tech roles. So far in 2024/25, there have been around 62,000 adverts live each week, a decline of 49%. Over the same period, adverts for non-tech roles have also declined but by less, at 38%.** The fact that adverts for tech roles were relatively healthy before this period makes this difference starker.

Figure 1 – Volumes of job adverts in Adzuna data





Source for both figures: NFER analysis of Adzuna data. 2024/25 does not include a full year of data. See methodology.

The relatively rapid slowdown in recruitment in the tech sector in recent years is reflected in views shared from those working in the sector:

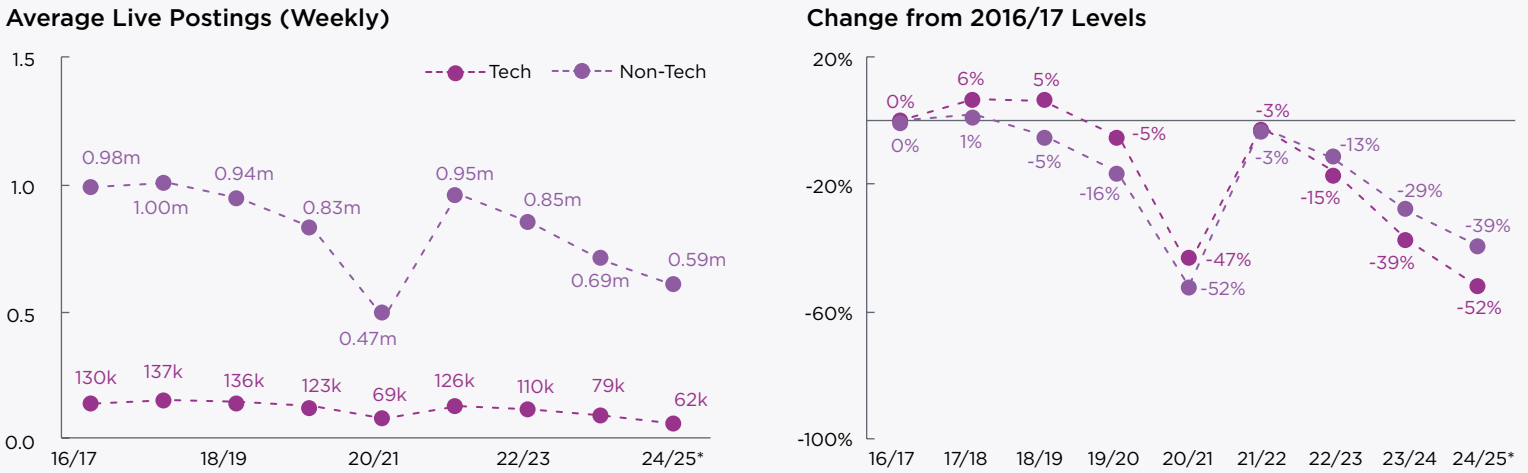
> **“The volume of tech jobs we’ve recruited in England has stagnated since 2016… with a sharper reduction post-2022.”**

> **“Volume (of tech jobs recruited for) has reduced and become more specific. There is less appetite generally in the market to hire for general growth in the IT sector.”**

The relatively fast decline in adverts for tech roles suggests that additional factors, beyond the wider macroeconomy, may have contributed to the reduction in hiring activity by employers of tech occupations. We start to explore what those factors might be as we take a deeper look at tech job adverts.

‘Core tech’ jobs, particularly those in programming and software development, have been disproportionately affected by the slowdown. This coincides with trends in other countries, particularly the USA.

Figure 2 – Volumes of job adverts in tech occupations and non-tech occupations



Source for both figures: NFER analysis of Adzuna data. 2024/25 does not include a full year of data. See methodology.

To focus more on the decline in opportunities in tech, we split tech occupations into two groups:

- ‘Core tech’ occupations include software development roles and IT roles, including managers, professionals and IT technicians.
- ‘Tech adjacent’ occupations include engineering, science and research and other forms of technician work (*e.g. in labs*).

Adverts for jobs in ‘core tech’ occupations have fallen more than jobs in ‘tech adjacent’ occupations or other non-tech occupations between 2016 and 2024. As shown in Figure 2, this has been particularly marked since 2021/22.

Job adverts for programmers and software development roles have tended to make up around half of all adverts for ‘core tech’ occupations. **As shown in Figure 3, this category has experienced a very large decline the number of listings, from weekly averages of around 40,000 in 2021/22 to just 14,000 so far 2024/25 – a decline of 65%.**

The other half of ‘core tech’ roles, which includes IT managers, professionals and technicians, have also seen job adverts fall steeply, although not to quite the same extent as software developers. Figure 3 suggests adverts for these jobs recovered to a higher level after the pandemic; since then, they have been on parallel trajectories.

In ‘tech adjacent’ occupations, such as engineering and technician work, there has been some decline since 2016 too. However, the rate of decline is not nearly as sharp as it is for ‘core tech’ occupations, as shown in Figure 2. This is particularly the case since 2021/22.

The contrasting fortunes of ‘core tech’ and ‘tech adjacent’ roles mean the latter group is much more significant, in relative terms now. **In the latest data, there are approximately as many live adverts for jobs in ‘tech adjacent’ occupations as there are for ‘core tech’ occupations. However, in 2019/20, there were twice as many adverts for ‘core tech’.**

The decline in listings for software development and programming jobs is mirrored in some other international markets, including USA, France, Germany, Canada and Australia, which all show similar trends to the UK (see Indeed, 2025, for USA data and l inks to other countries). As in the UK, job listings have also been falling in the wider USA economy since April 2022, but software development appears to be affected to a much greater degree. Other reporting suggests the American tech industry has been disproportionately affected by adverse economic conditions there. *(Silvergate, 2024)*

Some tech workers also told us they felt the slowdown in the American tech sector has contributed to the decline in UK recruitment:

“I initially saw an uptick in technology-related jobs (2022), but then a sharp decline as the ‘tech bubble’ in the US essentially burst (2023/24).”

Conversely, other tech workers told us they felt recruitment was surging in cheaper markets with emerging tech sectors, a view that is discussed later in this paper.

Figure 3 - Volumes of job adverts in 'core tech' occupations and 'tech adjacent' occupations

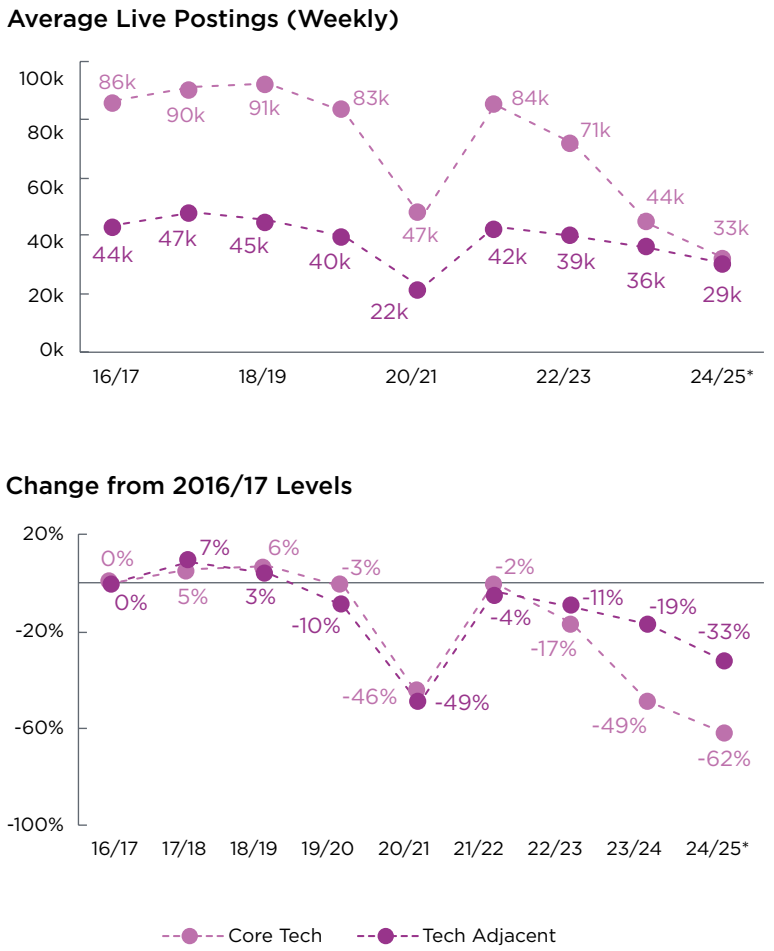
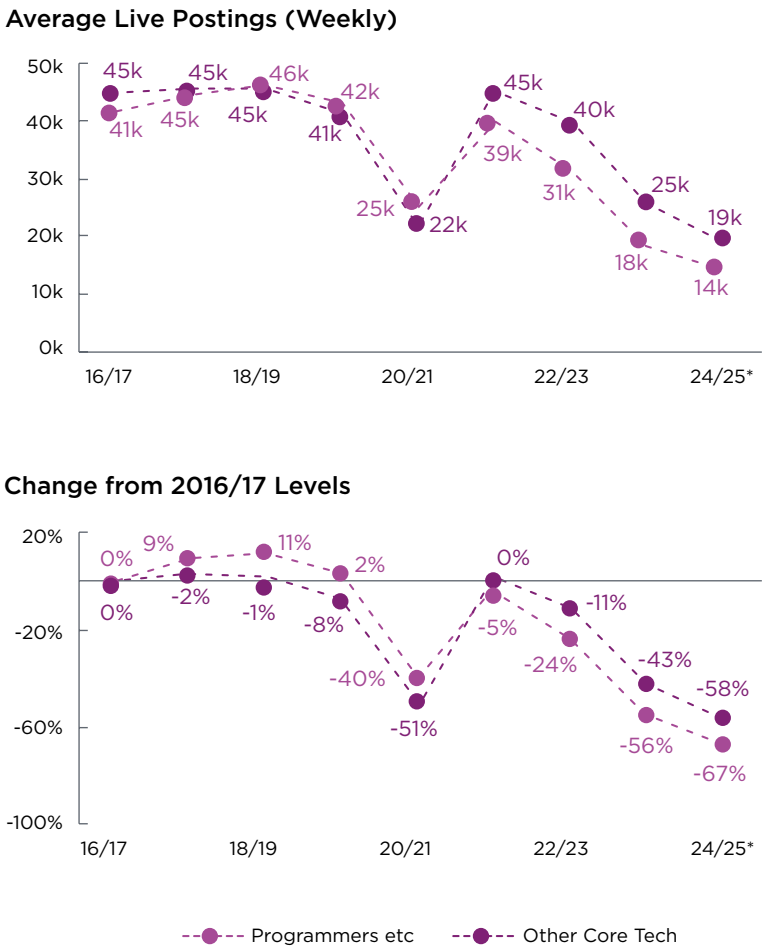


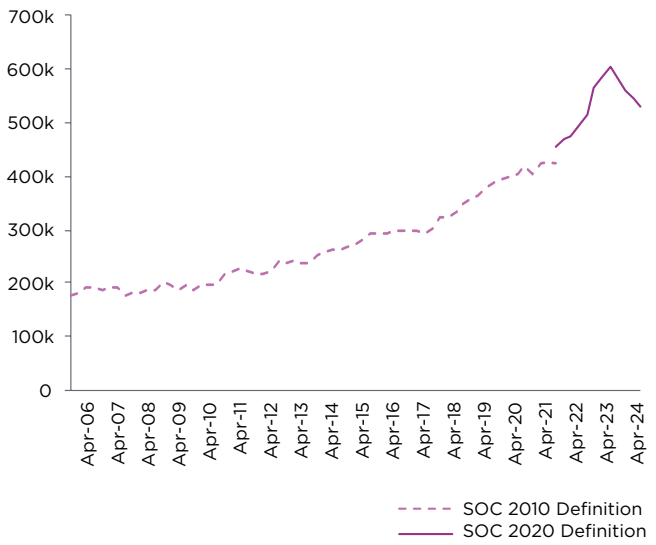
Figure 4 – Volumes of job adverts for programmers and software development professionals, compared to other 'core tech' occupations



Source for both figures: NFER analysis of Adzuna data. 2024/25 does not include a full year of data. See methodology.

The number of people working in many ‘core tech’ roles is also falling, driven by a lack of recruitment.

Figure 5 – Total employment of programmers and software development professionals in UK



Source: (ONS, 2025a) The midpoint of each survey period is used on the y-axis. Caution should be applied when comparing the two series as definitions change.

Given the significant decline in recruitment activity in tech occupations since early 2022, we would expect to see this affect the number of people employed in the sector.

This appears to be happening, with some delay. For example, Figure 5 shows how employment of programmers and software development professionals in ONS estimates has changed over time, going back to 2006. The estimated number of people working in these jobs in the UK started falling in the first half of 2023.

A sharp increase immediately before 2023 and a break in the series due to SOC definition changes in 2021 make it difficult to gage the significance of this change. **Nonetheless, there has been a clear fall since around April 2023, suggesting the job advert data is a leading indicator of employment trends. The fall in the number of software and development professionals (around 70,000, or more than 10%) is the largest in almost 20 years.**

The same ONS data (*not shown*) suggests a decline in other ‘core tech’ occupations too. For example, business analysts, architects and system designers; IT managers; and quality and testing professionals, have all seen a decline in employment starting in 2023. But it is not all bad news: other types of IT worker, including project managers, cybersecurity professionals and IT technicians, have seen growth in estimated employment numbers during this period.

This fall in employment will be of particular concern to policymakers who want to see growth in tech occupations fuel wider growth in the economy. The level of concern will depend on the extent to which this change is linked to temporary trends (*such as rising inflation*) or systematic shifts, which could be more permanent. Two factors that could fit this latter category are discussed on the next page.

> “Jobs in Eastern Europe and India have gone up by 30% due to ‘right-shoring’. I think this has been a trend across the industry.”

International competition appears to be dampening recruitment in ‘core tech’ roles in the UK, and AI is emerging as a critical factor too. More evidence is needed on both trends.

So far, we have seen that recruitment in ‘core tech’ roles in the UK has declined sharply since 2022, having been on a longer-term decline since at least 2017. This appears to be related to wider economic challenges, which evidence suggests have particularly impacted growth in the tech sector. We now discuss two other changes which may be explaining the recent data:

International Competition

Initial indications from tech workers are that more companies are choosing to make tech hires outside the UK:

“There is increased pressure to justify any hires in more expensive markets like the UK, rather than India and China, particularly given specialist knowledge is increasing in these countries.”

“We have replaced many of the UK-based roles with employees located in Ukraine, Belarus, Armenia, and Georgia…. we can access a highly skilled workforce in these countries at a lower cost [than in the UK]”

These verbatims suggest international competition is an important factor. Using existing data, it is difficult to gage the extent to which international competition is displacing tech jobs from the UK. Existing research illustrates huge differences between the average salary of a software developer in UK cities such as London or Manchester and large cities in other countries, reinforcing the notion that the UK market is expensive for employers (*CBRE, 2024*). These differentials existed before 2022, but other factors may have contributed to increased international competition:

1. Firstly, ‘pull factors’ continue to grow stronger as other countries develop their tech sectors. For example, recent reports highlight the fast rise of the IT sector in countries in Eastern Europe (*Emerging Europe, 2023*), and in India (*Deloitte India, 2024*). Human capital has grown rapidly in many countries – areas of China and India now top tables that measure tech talent globally. (*CBRE, 2024*)
2. There are growing ‘push factors’ too, linked to the pandemic and its aftermath. Cost pressures driven by rising inflation and interest rates may have led to some companies accelerating existing plans to build their capability in cheaper markets. For UK-based companies where many employees now work remotely instead of being in the office, the frictions associated with employing new workers outside the UK have been reduced. As such, employers may be more inclined to prioritise recruitment in countries where salaries are cheaper.
3. Finally, employer surveys have consistently highlighted a lack of skills in the UK, including in tech domains, which may have triggered more UK employers to look abroad. (*DfE, 2023*)

Artificial Intelligence

There are also indications that the rise of Artificial Intelligence (AI) may be contributing to observed trends in tech job adverts. AI is already creating new types of tasks and jobs. However, it will also reduce demand for workers if AI can replace roles or increase the productivity of other workers to such a large extent that fewer are needed (*Acemoglu and Restrepo, 2019*).

It is difficult to discern the extent to which the impact of AI explains the decline in tech job adverts between 2017 and 2024, or exactly how its impact will be felt in the coming years. It is commonly reported that generative AI has already had a large effect on 'core tech' occupations like software development (*Drenik, 2024*). These reports emphasise the ability of models to produce professional code with relatively little user assistance, or help users write code much faster than they would be able to otherwise. This would therefore suggest AI is having a significant impact on the trends highlighted above.

On the other hand, AI's rise has been sharper since Chat GPT-4 was released in March 2023, as can be seen in Google Trends data *(Google Trends, 2025)* – however, the fall in tech job advert volumes started earlier *(showing up throughout 2022/23 data)*, which suggests other factors were driving trends then.

Initial indications from people working in tech jobs in the UK also provide a mixed picture on the impact of AI to date:

"While we recognise the potential of AI and have seen some performance improvements, it is too early to definitively measure its impact on our hiring practices."

"There are AI tools that can now largely do the work a junior software developer, almost to the same quality, with a significantly higher throughput and at lower cost... There will always need to be senior engineers to provide the 'human' oversight and audit – but the sector will likely need fewer and with more experience."

"AI hasn't impacted roles directly, but we do see more projects coming in that require AI to be integrated into the project."

"We haven't automated roles... (but) I would say we have been a lot more cautious the last couple of years and leaning more on contract resources."

"Automation and AI have allowed us to streamline certain operations... However, these advancements have increased the demand for niche expertise... (which) requires advanced training."

Generally, the perspectives suggest that AI has not led to a large-scale reduction in recruitment because tech occupations are not being automated yet (*as of early 2025*). On the other hand, some suggest it is already having a significant effect in some businesses, whilst others also suggest it has led to extra caution around hiring people, because the situation is changing rapidly. What is clear is that almost everyone expects AI to have a very large impact in the future. (*Mayer et al., 2025*)

More Research Needed

This report highlights evidence which indicates that international competition and the development of AI are important factors to consider, when explanations for the decline in 'core tech' job adverts are unclear, but further research is needed. We are seeking to address these gaps in our research agenda, which will look at the effect both these trends have had on recruitment plans for tech employers in the UK. For now, we go on to look at another key trend in the job adverts data.

The decline in the number of jobs adverts for tech occupations is concentrated in junior grades, but employer size appears to be less important.

Junior vs Senior Job Adverts

Amongst job adverts for software developer roles, we see evidence that the ratio of senior roles to junior *(or entry)* roles has changed over time, with senior roles increasing as a proportion of the whole.

This is shown in Figure 6, which shows the percentage of job listing for programmer roles listing a specific seniority. Whilst most roles do not have seniority level listed, we see that that there were twice as many adverts for senior roles as junior or entry roles in 2016/17, and that has now risen (*in 2024/25*) to four times as many.

This reinforces the view that young people now have fewer opportunities to work in tech than they did five years ago, as the fall in adverts has not coincided with a visible increase in the proportion of entry or junior level roles. As outlined above, the data is incomplete here – around three quarters of roles do not have a seniority level recorded – so some caution is needed.

However, it is reflected in perspectives shared from workers in tech sectors;

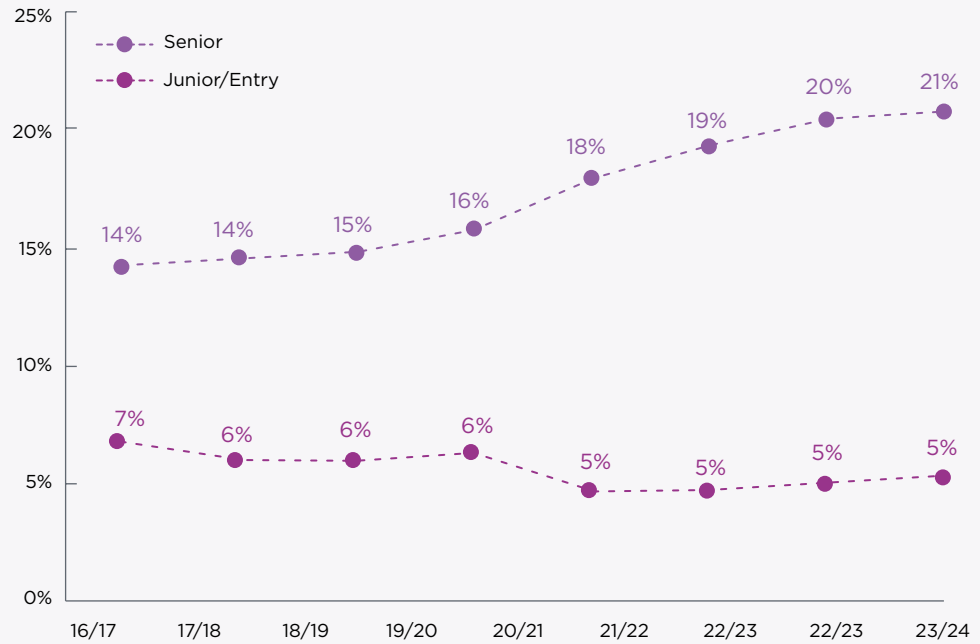
> ***"In the past 24 months, I would say entry-level roles across software development and cybersecurity have both fared poorly."***
>
> ***"There has been a notable shift towards seeking more senior-level candidates with a proven track record of success in large-scale projects."***
>
> ***"Job adverts now look for more qualified/ senior profiles compared to before. The volume of entry level jobs has decreased significantly."***

As well as raising concerns about access to the sector today, this trend may have long-term ramifications. Over time, a reduction in junior recruitment could feed through into shortages of experienced workers able to progress into the senior-level tech roles which are still in demand. The growth in senior positions may also be linked to AI, if roles incorporating AI solutions into businesses require senior leaders, or if more companies are seeking to hire highly experienced staff who will be able to use AI to replicate the work of more junior staff.



Figure 6 – Seniority level of job adverts associated with programmers and software development professionals

Percentage of job adverts for 'programmers and software development professionals' at each seniority level



Source: NFER analysis of Adzuna data. Most adverts do not have a seniority level in the data.

Other Factors

The trends we have found in tech (which is generally higher paid than other sectors) could also reflect that we are picking up a decline in higher salary occupations generally. This does not appear to be the case. The average advertised salary has generally been on an upward trend in Adzuna data *(Adzuna, 2025).*

We also looked at whether the trends in the Adzuna data could be explained by larger employers or small employers scaling back their hiring disproportionately. Our initial analysis (not shown) did not support this hypothesis.

Finally, it is possible that one contributor to the trends observed are due to changes in recruiter practices. If people are 'head hunted' for roles that are not advertised publicly online, this would not show up in our data, biasing the comparisons we make between years. Some workers in tech occupations told us this does happen, especially for senior roles. However, there would have needed to be a huge rise in this type of activity to explain the recent trends we have highlighted, so we do not believe it is a major factor in the decline we have documented.

Conclusions to Section 1

The data on job adverts and job numbers shows us that recruitment activity in 'core tech' occupations in the UK is falling faster than in the wider economy, especially from 2022/23 onwards. We have suggested various reasons for this, including rising costs, interest rates, sectoral cutbacks, international competition, and the rise of artificial intelligence. There is also some evidence that junior roles are worse affected than senior ones. Further papers in this research programme will help unpack further why this is happening.

We now go onto to look further at what is happening to demand for workers in tech occupations by reviewing data on the skills and qualifications listed in job adverts.

Section 2: Skills Requirements in Job Adverts

Skills requirements are changing for tech jobs faster than other jobs, which again suggests tech occupations are particularly affected by recent trends.

We have analysed data on the skills mentioned in job adverts, aggregating how many times each is mentioned across adverts and ranking the relative importance of each skill type, based on the number of times they are referenced.

Adzuna parses job adverts data to classify adverts by the skills needed for each job, using a taxonomy of over 20,000 skills. Figure 7 shows how the ranking of most frequently requested skills in job adverts is changing over time, for tech occupations and non-tech occupations. Skills that feature in the top 20 skills in any year are included. Comparing the two charts, it is striking how much more change there has been in the ranking of skills in tech occupations compared to non-tech occupations:

- **In non-tech occupations, all the skills that feature in the top 20 skills in each year are in top 30 skills in all years between 2016/17 and 2024/25.**
- **In tech occupations, skills that were previously ranked highly have dropped out of the top 30 skills and been replaced by skills that were previously mentioned less often.**

This data reinforces the view that tech occupations have been disproportionately affected by recent trends.

Demand for software development skills in job adverts is declining fast and general skills are on the rise.

Figure 7 also shows that skills associated with software development and programming have relatively less mentions in job adverts for tech occupations in 2023/24 and 2024/25 than they did in 2016/17. **Skills which have seen a decline in their mentions, relative to other skills, include: Software Development, Programming Languages, Web Design and Development and Database Technology. The relative demand for these skills fell particularly rapidly between 2020 and 2024.**

This trend will of course be driven, at least in part, by the decline in demand for programmers and software developers highlighted earlier. The fall in job adverts for these types of occupations has been faster than the decline in other occupations, including other tech occupations.

It may also be the case that an increasing share of tech jobs are highly specialised, demanding a more specific set of skills than can be captured by labels like 'Software Development' or 'Database Technology', but without appearing in the top 20.

The wider skills data reinforces the view that software development has been particularly affected by recent trends. **Demand for other tech skills has fared better, at least in relative terms. Engineering, Science and Research, remain solidly in the top ten skills demanded across all tech jobs.** Mentions of IT skills have declined in rank across adverts for both tech job and non-tech jobs but are still in the top ten for both groups in 2024/15.

We heard some reports of this from the industry:

> **"We are increasingly looking for candidates with specialised technical skills in blockchain protocols, machine learning, and advanced cybersecurity."**

> **"Our skill requirements have extended from core software engineering into Data, Cloud, AI – modern applications of usual software engineering"**

Other, more general skills – or skills requiring knowledge of other subject areas – have also become more significant in tech occupation listings as mentions of software skills have fallen. The relative importance of business skills in job adverts for tech occupations has increased, despite being in decline for non-tech occupations. Project Management entered the top 10 for tech occupations in 2023. Skills in Marketing and Public Relations; Healthcare; and Law, Regulation and Compliance are also referenced more in job adverts for tech occupations, relative to other skills. This may mirror wider trends, as these skills have tended to become more popular in non-tech occupations too. We heard report that general skills are a vital part of roles from employers and workers:

"I have updated the skills requirements of the roles I'm responsible for to include more business/comms related skills, and also more 'big think' (skills)."

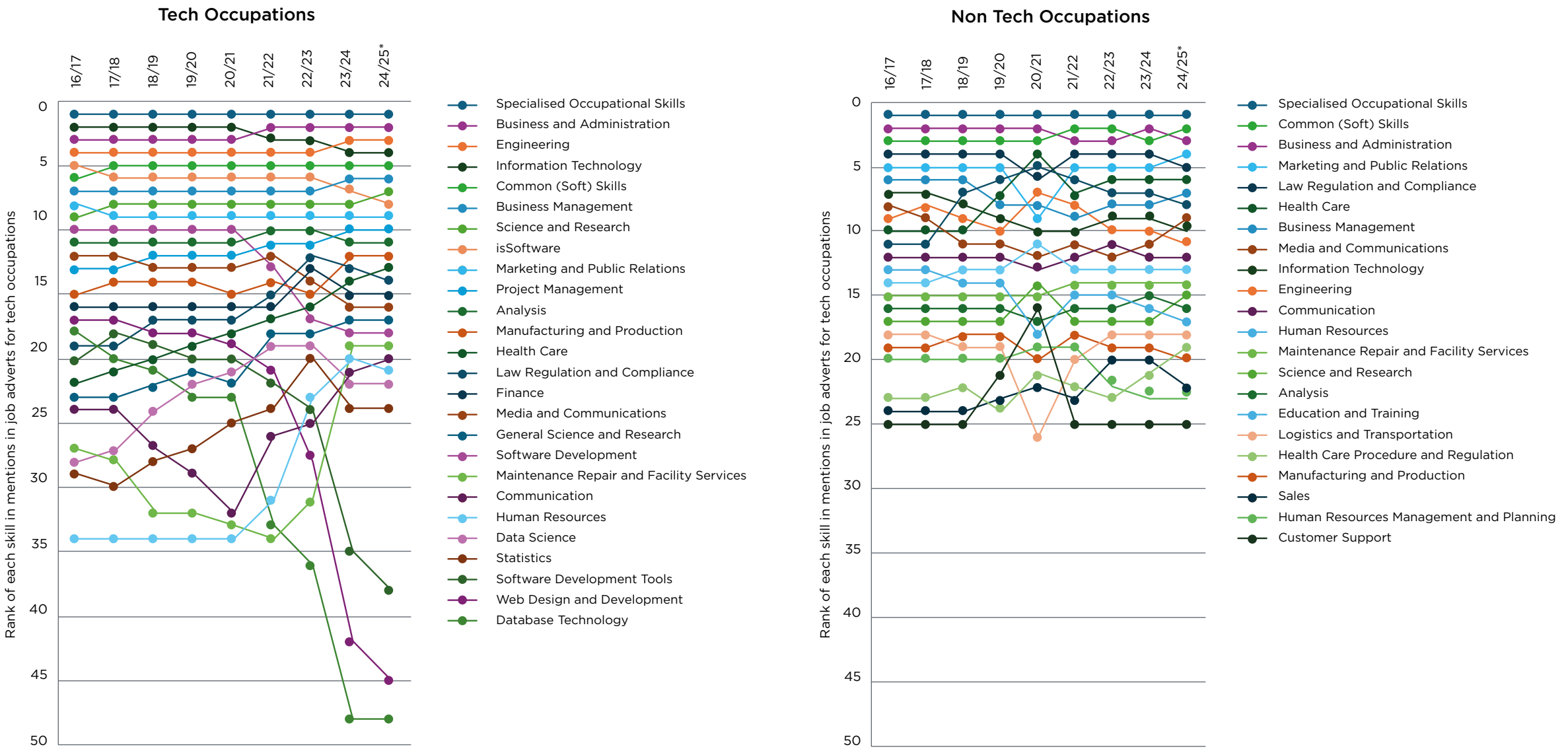
"Soft skills like adaptability, problem-solving, and collaboration have become increasingly important."

Conclusions to Section 2

As in Section 1, the labour market appears to be changing faster for tech roles, particularly 'core tech' roles, than the wider economy. The skills mentioned in 'core tech' job adverts are changing relatively fast, with some technical skills like software development becoming relatively less important and other skills such as Project Management, and some technical specialisms like Data Science, becoming relatively more important.

We now go on to look at how qualification requirements have changed in roles.

Figure 7 – The ranking of top 20 skill requirements in Adzuna job advert data, between 2016/17 and 2024/25



Source: NFER analysis of Adzuna data. Caution should be used when looking at 2024/25, which does not include a full year of data. See the methodology for more information.

Section 3: Qualification Requirements in Job Adverts

In the available data, tech jobs are more likely to require qualifications than other jobs, and this gap has grown recently.

Overall, only around one in ten adverts have an explicit qualification requirement which is then captured in Adzuna job advert data. This may be because qualification requirements are given to candidates outside the online advert (*for example, on the application form or in a pack*), or because the qualification requirements for a given profession are assumed. Figure 6 shows how the percentage of job adverts that state a qualification requirement has varied over time, split by tech and non tech occupations. We can see that qualification requirements are more common in adverts for tech occupations than other occupations.

Figure 8 also suggests a larger proportion of job adverts had a qualification requirement in the most recent years, and this was particularly the case for tech jobs. In the 2024/25 financial year to date, 20% of adverts for tech occupations had a qualification requirement, compared to 10% of other adverts.

Back in 2019/20, before the pandemic, the respective percentages were 12% and 8%, so there is some evidence the gap is widening, particularly in the most recent years.

The increased proportion of adverts asking for qualifications is probably linked to the reduction in the number of adverts overall. If there are less adverts generally, reflecting a more competitive environment for applicants, employers may have extra incentive to state qualifications and be openly selective about having only the most qualified candidates. This trend may also be driven by the decline in software development jobs overall, as these adverts have not tended to state qualification requirements.

Indeed, some voices from the sector emphasised that qualifications are not as important as evidence of experience or skills:

> “We do not target University Grads as much, as we see the value in Career Changers who have attended a Bootcamp or self taught.”

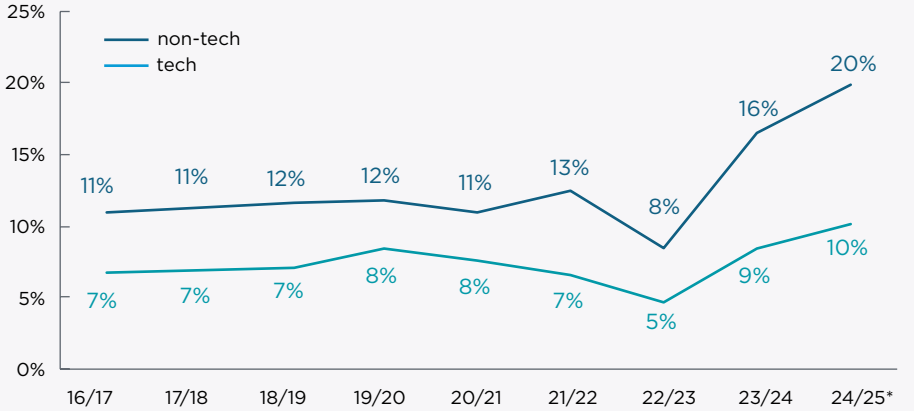
Tech jobs have consistently required higher levels of qualifications than other jobs.

In Figure 9, we look at how qualification requirements differ across job adverts in the 2024/25 financial year (*up to November 2024*). We use qualification levels to summarise different types of qualification. For example, Level 6 is the equivalent of a full undergraduate degree. An advert can specify more than one level of qualification, in which case it is counted in multiple columns. We only look at adverts where a qualification is specified.

Adverts for tech roles have more demanding qualification requirements than non tech roles and are more likely to require qualifications at Level 4/5, Level 6, and Level 8. (*See the chart for examples of each level.*) For example, 47% of relevant adverts for tech occupations stated that an undergraduate degree or equivalent (*Level 6*) was required, compared to only 32% of relevant adverts for other occupations. (*There is an exception at Level 7, due to teaching jobs in non-tech occupations requiring Level 7 teaching qualifications.*)

Figure 8 – The proportion of job adverts that have a stated qualification requirement on Adzuna

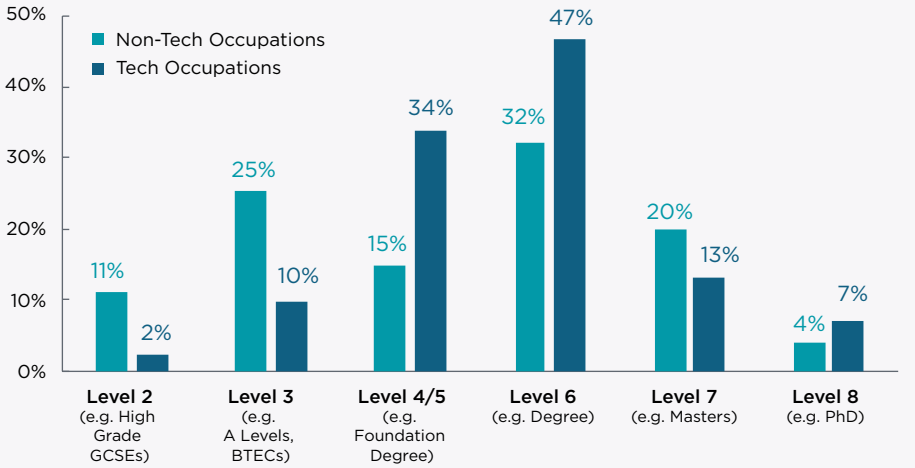
Proportion of job adverts that require a qualification



Source: NFER analysis of Adzuna data. Note this data only includes adverts where a qualification level was specified..

Figure 9 – The proportion of job adverts that have qualification requirements at each level in 2024/25 FY

Proportion of job adverts with qualification at level specified, of those with any qualification level specified



This data is unsurprising. Jobs in tech occupations tend to be higher skilled and higher paid than the average across non-tech occupations. Indeed, the data presented in Figure 9 has not changed much over time. Of job listings with some qualification requirement, about the same percentage each year request Level 6 qualifications, for example. This means that when combining the trends in Figure 8 and Figure 9, in aggregate, qualification barriers are rising.

Conclusions to Section 3

Overall, the data tentatively suggests qualification barriers to tech jobs are rising. Tech jobs tend to list qualifications requirements more often than non-tech jobs, especially in recent data, and where qualifications are mentioned in adverts, they tend to be at a higher level for tech jobs.

A response from the sector mirrored this view:

> *"Employers have asked for more qualifications (e.g. diploma and experience) rather than less when recruiting in recent years despite the industry movement for more skills or competencies-based hiring."*

Next Steps

This report has outlined key trends in adverts for tech jobs in the UK. It is the first output of a wider research programme looking at pathways for young people into tech. The programme, funded by The Hg Foundation and carried out by the National Foundation for Educational Research, will take place over 2025. The research will answer the following questions:

- How do different educational pathways (including educational choices and achievement) support entry into the tech workforce?
- To what extent are there disparities for different beneficiary groups (by disadvantage, ethnicity and gender) in entry, progression and earnings into the tech workforce?
- What value do employers place on qualifications and grades in hiring for tech roles?
- To what extent do tech employers seek diversity in their workforce and what strategies do they use when hiring to fill vacancies and support career progression?

This initial piece of exploratory analysis raises questions about the implications that changes in employers' demand and behaviours might have had on educational pathways into tech and disparities in the tech workforce. These questions will be explored further in two subsequent reports, which will be published later this year.

One of these two reports will present perspectives from across a wide set of UK tech employers on their experiences, how their behaviours and preferences have changed, the perceived causes and consequences of hiring trends, and what they expect to happen in the future.

The other report will present the results of analysis of administrative data on educational trajectories into the tech workforce and how these have changed over time.

In the meantime, feedback from readers on the trends presented in this report are greatly appreciated; please share these by responding to the survey questions embedded in the report blog on the NFER web page here.

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Annex

Occupational Classifications

We broke job adverts data down by occupation by using the Standard Occupational Classification (SOC) 2020 system. Our focus is on technology jobs. Building on existing approaches (*e.g., DfE, 2024*) we identified occupations listed in the SOC system that can be described as 'tech occupations', as outlined here. All other occupations were defined as 'non tech occupations'. Within the tech jobs, we split the group further into 'core tech' and 'tech adjacent' for some analysis. This is also outlined here.

Table 2 – SOC 2020 occupations classified as 'tech occupations'

'Tech Occupations'

'Core Tech Jobs'

1137	Information technology directors
2131	IT project managers
2132	IT managers
2133	IT business analysts architects and systems designers
2134	Programmers and software development professionals
2135	Cyber security professionals
2136	IT quality and testing professionals
2137	IT network professionals
2139	Information technology professionals n.e.c.
2141	Web design professionals
2142	Graphic and multimedia designers
3131	IT operations technicians
3132	IT user support technicians
3133	Database administrators and web content technicians
3544	Data analysts

'Tech Adjacent' Occupations

2111	Chemical scientists
2112	Biological scientists
2113	Biochemists and biomedical scientists
2114	Physical scientists
2121	Civil engineers
2122	Mechanical engineers
2123	Electrical engineers
2124	Electronics engineers
2125	Production and process engineers
2126	Aerospace engineers
2127	Engineering project managers and project engineers
2129	Engineering professionals n.e.c.
2161	Research and development (R&D) managers
2433	Actuaries economists and statisticians
2481	Quality control and planning engineers
3111	Laboratory technicians
3112	Electrical and electronics technicians
3113	Engineering technicians
3115	Quality assurance technicians
3116	Planning process and production technicians
3119	Science engineering and production technicians n.e.c.
3120	CAD drawing and architectural technicians
3212	Pharmaceutical technicians
3573	Information technology trainers
3581	Inspectors of standards and regulations
5242	Telecoms and related network installers and repairers
5244	Computer system and equipment installers and servicers
8119	Process operatives n.e.c.
8133	Energy plant operatives
8139	Plant and machine operatives n.e.c.
8143	Routine inspectors and testers

Source: NFER

Seasonality

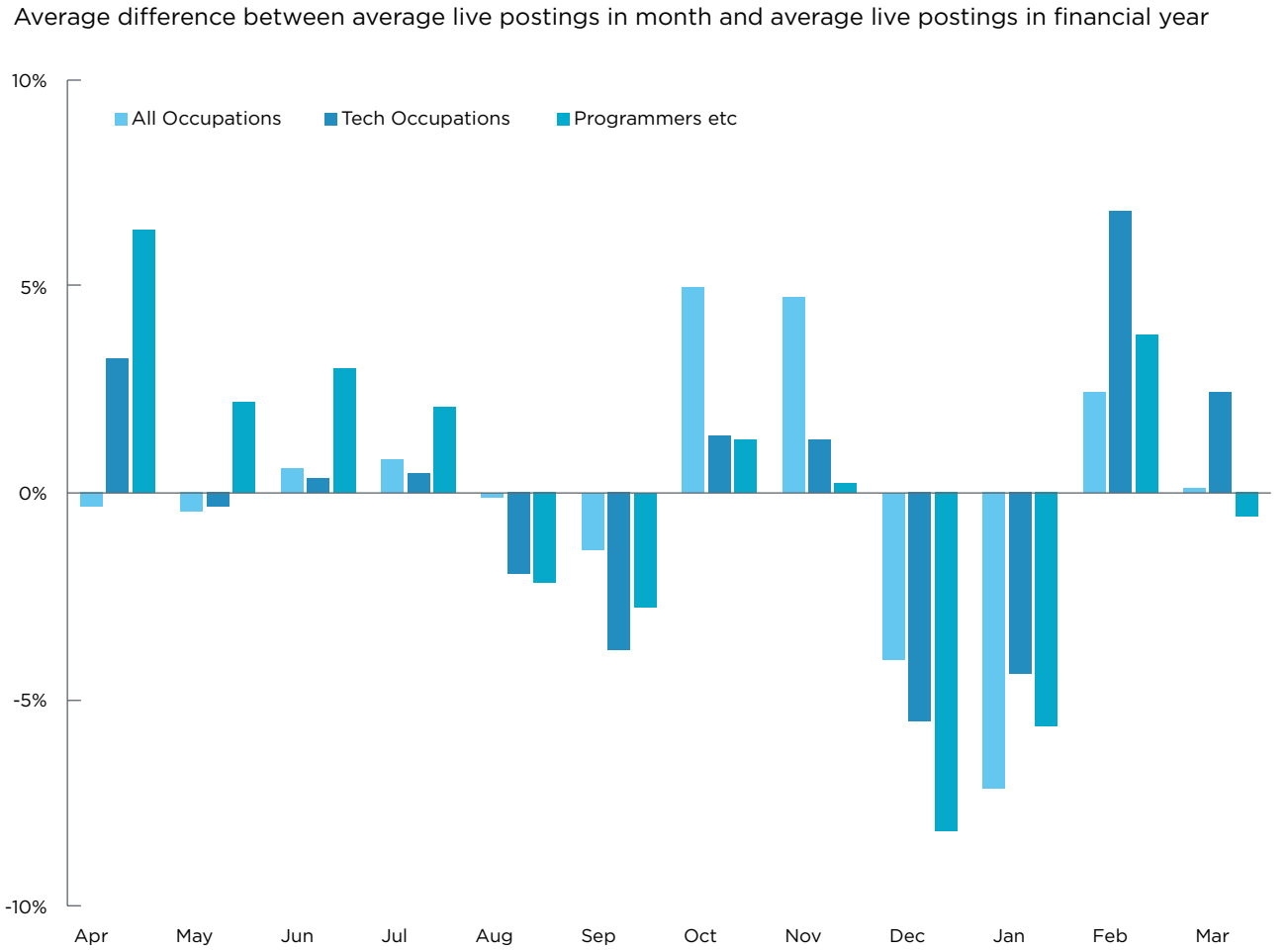
The Adzuna data used in this report covers the 2024/25 financial year between April 2024 and November 2024. In the report, we report year-to-date figures for 2024/25, covering the first two thirds of the year. The data tends to show a substantial fall in average weekly adverts going from 2023/24 to 2024/25, particularly in tech occupations. It is possible that our approach may eventually exaggerate this fall if the data recovers in the last third of the 2023/24 financial year.

To investigate this, we look at seasonality, which describes a repeated pattern that occurs in data over a set time frame. For example, a pattern may repeat over the 12 months in a financial year. If adverts are consistently much stronger in the last third of the financial year, then the data shows a strong seasonal pattern. If this were true, the year-to-date average between April and November would consistently be less than the average for the full year. It would also have the potential to affect analysis in sections 2 and 3 too.

Figure 10 suggests the data has some seasonality, but this is not a problem for presenting 2024/25 year-to-date figures in this report. Across all years between 2016/17 and 2023/24 and for each calendar month, the y-axis measures the difference between the average number of live postings in that month and the annual average. For example, a figure of 6% in April would mean that, on average across the eight years, there were 6% more live postings in April than there were on average across that full year, eventually. For all three groups we look at, the figure suggests live postings tend to dip in December and January, although these dips are not very large, at under 10%.

If this occurs again in 2024/25, then the average number of live postings for the full year 2024/25 will probably be below the year-to-date figure we have calculated using data between April and November 2024. As such, if anything, using 2024/25 year-to-date figures may eventually understate the figures for the full year once they become available. Reassuringly, this effect is likely to be very small. For live postings for all occupations, the average across April to November has been about 1% higher than it was across the full year, on average. If this is repeated in 2024/25, it would make very little difference to our findings.

Figure 10 – Average difference between monthly live posting and annual live postings, between 2016/17 and 2023/24



Source: NFER analysis of Adzuna data

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