



The Pissarides Review
into the Future of
Work and Wellbeing

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Old skills, new skills: what is changing in the UK labour market?

Paper prepared by Rui Costa (Centre for Economic Performance), Zhaolu Liu (Imperial College London), Christopher Pissarides (Institute for the Future of Work) and Bertha Rohenkohl (Institute for the Future of Work)



Institute for the
Future of Work

Imperial College
London



Centre for
Economic
Performance



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Abstract

The UK, along with other industrial countries, has recently undergone rapid technological change associated with robotics and artificial intelligence, jointly known as automation technologies. This is precipitating significant transformations in terms of how work is organised, what tasks are performed and what skills are essential for success. Quantifying the scale and nature of these changes to skills requirements is important as we aim to better understand the impacts of automation technologies on the UK labour market. Without the right mix of skills, economies cannot respond and adapt, nor take advantage of new advances in technology that will help to improve productivity. This is why research into skills is a central part of the Pissarides Review into the Future of Work and Wellbeing.

In this report, we use a comprehensive dataset of online job postings from Adzuna, which provides information on the type of positions advertised and the skills that they require. We focus on the evolution of skill requirements from 2016 to 2022. The period, selected based on the availability of data, offers a valuable perspective on the recent shifts happening in the UK labour market. These changes are reflected in the rapid emergence of new skills and the disappearance of other, old skills. Notably, most skills becoming obsolete and new ones emerging to take their place, are related to IT. For example, while in 2016 it was common to see job postings requiring basic computer literacy, like web navigation, in 2022 we find an increased demand for new IT skills such as cybersecurity, the ability to work with AI and cloud solutions.

We quantify the magnitude and pace of skill change and find that it varies considerably across occupations. Occupations like IT directors, production engineers and cybersecurity professionals have experienced a high turnover of skill requirements over our six-year period. This contrasts with slower-changing occupations, such as teaching, carpentry and several elementary trades.

Our analysis spans multiple dimensions, such as the type of skills required, their concentration across occupations, and whether they are specialised or general. We place particular emphasis on the growing importance of technology-related skills. In 2022, a large share of job vacancies, across several occupational groups, require competencies in IT and advanced data analytics, and we delve deeper into the specific types of tech skills undergoing the biggest changes. This reflects the ongoing integration of new technologies in work and highlights the need for continuous skill development in this constantly evolving market.

Of course, although technology skills are for understandable reasons the ones that are attracting a great deal of attention in public discourse, there is no escaping the fact that, once the data is dissected, by far the most popular skills remain the ever sought-after ones: clear communication, high-quality client services, efficient office management and effective customer relations. This reflects the structure of British business, and it points to the fact that - despite the automation hype - when it comes to direct contact with customers or colleagues, the ability to effectively manage relations at the personal level is still a skill that the majority of companies request.

1. Introduction

Rapid technological advances are profoundly changing the labour market. Work is undergoing significant transformations in terms of how it is organised, what tasks are performed and what skills are essential for success. Without the right mix of skills, economies cannot respond and adapt, nor take advantage of new advances in technology that will help to improve productivity. Understanding skills, and the changes in skills demand, is thus a cross-cutting issue encompassing questions around economic policy, industrial strategy, education and the changing role of universities, as well as the deeper purpose of work. This is why, in the context of technological disruption, research into skills is a central thread in the Pissarides Review into the Future of Work and Wellbeing.

In *A Disruption Index – the geography of technological transformations across England* (forthcoming, April 2024), we collected and classified data on factors that are related to technological disruption at the regional level, restricting ourselves for data reasons to NUTS2 regions in England. By disruption, we mean the introduction of new technologies that necessitate a change in the way work is organised and the readiness of the regions to take on these new technologies. This report and the Disruption Index are closely related because skills play an important role in informing us how ready a geography is to receive new technology. Once technological disruption takes place in an area, firms will require new skills to produce with the new technologies.

In this paper, we lay the groundwork for considering in greater detail how skills relate to disruption. We consider a larger and more detailed dataset drawing on the whole of the UK, looking at different kinds of skills and making sense of changes in skill demands. We delve deeper into the type of new skills that firms require, and the extent of change. In the next stage of our research in the Pissarides Review, we will then bring closer together this research and the Disruption Index by considering the geography of skills disruption and how it is related to technology disruption. This will explore in what areas of the country firms are changing their demands for skills, and in which occupational groups and competencies.

While - beginning with Carl Frey and Michael Osborne (2017) - many discussions about the impact of these developments in the labour market have focused on job losses, we believe that this perspective is hiding more important changes taking place. New jobs are always being created alongside the loss of jobs to new technologies. This was observed in every period of rapid technological change since the early days of industrialisation. We believe that - rather than job changes - many more changes are happening within jobs, in how workers do their work amidst evolving roles and changing skills needs. In this sense, rather than speculating about job displacement, we focus here on gathering information on skills and discovering what skills are required as businesses adopt new technologies, which is a crucial aspect of understanding the impact of new technology on workers.

In this report focusing on the changing demand for skills, we dissect the skill requirements of UK online job vacancies between 2016 and 2022, discussing what has changed and what has remained the same. We use data from the online job adverts collected by Adzuna, a

leading online job search engine that aggregates information from thousands of sources. The Adzuna data accounts for about 93% of the vacancies collected by the Office of National Statistics (ONS) for their survey of businesses (Ihsaan Bassier et al., 2023), and the comprehensive information it provides has also been used by the ONS to monitor contemporaneous changes in UK labour markets (see ONS, 2021).

Job vacancy data offer a real-time snapshot of current skills demand because the skills possessed by workers recruited now are of value to employers today and likely to be most relevant and in use in the immediate future. This contrasts with more traditional approaches to skill requirements, which infer skill changes from expected changes in the composition of jobs and the skills possessed by workers employed in these jobs (Andrew Dickerson et al., 2023, Maarten Goos et al, 2014 and Daron Acemoglu and David Autor, 2011). Other advantages of using this type of data are its richness, timeliness and granularity, as highlighted by the OECD (Emile Cammeraat and Mariagrazia Squicciarini, 2021), allowing for a detailed understanding of skill changes beyond the broad conceptual categories typically used in surveys.

A key driver of changing skills requirements is the introduction of new technology. While skills requirements evolve for a variety of reasons – from structural changes to shifts in the demand for new services or products – over long periods of time the main reason is the emergence and adoption of new technology. For example, when banks first introduced ATM machines in the late 1960s, front office employees in bank branches learned how to service these machines, and others learned how to explain their use to account holders, engage in relationship banking and offer advice on financial services. The skills required for these new tasks would have started appearing in job adverts after the introduction of ATM machines, whereas the skills previously required, such as cash handling, became less prominent. Our dataset on job vacancies captures such shifts, providing insights into evolving skill requirements over the period analysed.

While our analysis is not confined to specific job types, one of our primary goals is to investigate the evolution of technology-related skills associated with the development and implementation of new digital technologies. We examine the quantity and type of skills in demand, as well as the pace at which skills requirements are changing across occupations. To do this, we employ the method recently developed by David Deming and Kadeem Noray (2020). The main feature of this method is the concept of “speed of change”, which measures the degree of change in the demand for skills, including the emergence of new skills and the disappearance of others in given occupational groups.

Our findings align with the earlier work on job flows (e.g., Steven Davies and John Haltiwanger, 1990), and with a large recent literature on automation technologies and the “fourth industrial revolution”², we observe a rapid emergence of new skills, and many others disappearing. Examples of new skills are design thinking, working in virtual learning environments, promoting sustainable development and understanding and using artificial intelligence. Conversely, examples of old skills include engaging in internet marketing, recruitment advertising and call recording. It is apparent that whereas new skills are genuinely new worker capabilities that firms are actively seeking, old skills include both

² See, for example, Autor et al. (2022), Autor (2022), Brynjolfsson et al. (2018), Kelly et al. (2021), Kogan et al. (2021), Lin (2021).

acquired knowledge, like knowing how to download data from the internet or how to navigate the web, and skills that may have been made redundant due to automation.

Not surprisingly, given the digital nature of rapidly emerging technologies, different types of IT skills occupy both ends of skill changes, requiring new skills and giving up on old skills, more than any other thematic skill category. Our analysis shows that 8% of job ads in 2022 featured new IT skills, whereas approximately 26% of IT skills advertised in 2016 were much less in demand in 2022. Examples of new skills include DevOps, CI/CD (both methodologies used in software development), Cybersecurity and Machine Learning. Examples of IT skills that were mentioned less frequently in 2022 include Microsoft SQL servers, PHP (scripting language) and HTML5 - all of which remain widely used, but the market has now diversified and advanced in the computer skills that it now requires.

The rate of change of skill requirements varies substantially across occupations. Rapid skill changes – or high skill turnover – are taking place in occupations such as IT directors and cybersecurity professionals, while others like teachers and carpenters see much less change. Decomposing the skill turnover reveals that the largest share of change relates to shifts in “core” skills. These are defined as skills that were already widely used in 2016 and mentioned in at least 20% of job adverts within a detailed occupational category (at 4-digit code level under the Standard Occupational Classification (SOC)). Examples of core skills that increased substantially during this period are data analysis, leadership, social media, UI design, strategy execution and technical support.

An examination of technology-related skills requirements, focusing on IT and advanced data analysis, reveals a large increase in their mentions in job adverts over this period. In 2022, as many as 34% of vacancies mentioned at least one IT skill, and 23% mentioned the need for at least one analysis skill. The most cited IT skills across sectors were Computer Literacy, Programming, SQL, and Databases. Popular analysis skills included Analytics, Data Analysis, Forecasting, and Business Intelligence. These technology skills were especially prevalent in adverts for jobs in Science, Research, Engineering, and Technology, where 85% of adverts required IT skills and 42% demanded analysis skills. The technology skills are also in high demand for Corporate Management, Business, Public Service, and Administrative roles.

The remainder of this report explores these findings, shedding light on the evolving landscape of skills requirements in the UK labour market, especially in the context of technological progress and changing work demands. In section 2 we provide an overview of our data. Section 3 discusses emerging and disappearing skills. Section 4 examines which jobs are changing the most, focusing on skill turnover. Section 5 explores the importance of core skills and Section 6 takes a closer look at technology-related skills.

Skills type and categories

All skills are sorted into two classifications, depending on their applicability:

Categories	Definition	Examples
Common skills	General competencies that may be relevant to a wide range of occupations. This includes, for example, social skills, life skills, personal traits and widely used digital technologies	'Communication', 'Management', 'Assertiveness', 'Microsoft Word', 'Microsoft Excel'
Specialised skills	Skills specifically required for more precisely defined tasks and associated with specific occupations. They are often referred to as technical or hard skills	'Marketing', 'Account Management', 'Python', 'Data Analysis', 'Construction'

And into four types, depending on their current demand (or popularity):

Types	Definition	Examples
Emerging (or new) skills	Skills mentioned at least three times more frequently in 2022 compared to 2016	'Artificial Intelligence', 'CI/CD', 'Cybersecurity', 'DevOps', 'Logical Reasoning', 'Resilience'
Disappearing (or old) skills	Skills with half or less as many mentions in 2022 as in 2016	'Telemarketing', 'Digital Media', 'Audio Transcription', 'Internet Marketing'
Core skills	Skills mentioned in at least 20% of all job postings for a specific occupation (4-digit SOC level)	'Leadership', 'Communication', 'Teaching', 'Data Analysis', 'Strategy Execution', 'Research'
Other skills	Remaining skills, which could not be classified as new, old or core.	'Creative Design', 'Business Events', 'Relational Databases', 'Payroll Processing', 'Systems Architecture'

2. Job vacancy data

We use data on UK online job adverts, sourced from Adzuna for the month of September in 2016 and 2022. We have chosen September because of its relatively low seasonal fluctuations. It is free of holidays, extreme weather events in either direction and other factors that might make employers and employees behave differently from typical, average behaviour.³

Adzuna is a comprehensive online job search engine that aggregates information from a variety of sources, including employers' websites, recruitment software providers and traditional job boards. It aims to encompass a wide spectrum of job ads, providing information on the stock of job postings and covering an estimated 90-100% of all vacancies placed online in the UK. This dataset contains rich textual information on the job description, as well as information on job titles, 4-digit SOC codes, the name of company advertising, the date placed online, and skills required, which are extracted by Adzuna from the job descriptions.

Job adverts are captured on an ongoing basis through weekly snapshots from Adzuna's sources. We consider all available weekly snapshots for our two months in 2016 and 2022. We apply a deduplication process to include only the first appearance of a job vacancy even if the same advert remains active online for longer than one week. When examining job adverts, it is important to differentiate them from the actual number of jobs available. The reasons behind a new advert will vary - employers might be introducing a new position, replacing a departing employee, or gauging the talent pool. A surge in such adverts implies increased hiring activity, but this doesn't necessarily equate to an equal increase in the number of actual jobs. This is the spirit in which we analyse our data - telling us which skills are changing, rising or falling in importance, in new hires, without paying attention to the actual number of jobs that request them.

As our starting point, and for analytical convenience and comparability with other studies, we use the skills extracted by Adzuna, which are based on keywords and phrases from job descriptions, keeping to their terminology. We then match these skills to the Open Skills taxonomy developed by Lightcast (formerly known as Burning Glass Technologies), another organisation specialising in online job adverts data. This is an open-source library of more than 30,000 skills that offers a hierarchical structure, enabling the classification of these skills into 32 thematic groups and over 400 subcategories.⁴ We emphasise that we use the skills terminology in this taxonomy for analytical convenience and comparability, without necessarily endorsing it as a good description of the competencies expected from each skill.⁵

³ September 2022 happens to be just a couple of months before OpenAI's ChatGPT was released, and the popularity of Large Language Models (LLM) increased exponentially. Although we expect this development to have a large impact on skills requirements, as our data ends in December 2022, it is not suitable for an analysis of the impact of these technologies.

⁴ <https://lightcast.io/open-skills>

⁵ The UK lacks its own skills taxonomy, but the Department for Education's Unit for Future Skills is actively working to create one.

To make the correspondence between the skills provided by Adzuna and those available in the Lightcast taxonomy, we employ a model developed by Nesta (2023) that matches skills by name, based on semantic similarity.⁶ We have further customised this code, conducted additional validation checks and curated the data to enhance the quality of the matched skill pairs and produce a refined skills dictionary. Additional details of this procedure are available in the Appendix. In our final sample, we consider a set of more than 3,700 skills.

The Open Skills taxonomy classifies skills into three categories, by applicability: Specialised Skills, Common Skills and Certifications. In this report, we focus on the first two, as Certifications may not be consistently referenced across various job postings in different occupations, and they often represent a basic set of occupational standards that overlap with other identified skills. “Common Skills” encompass social skills, life skills, personal traits and more general competencies that may be relevant to a wide range of occupations, such as ‘Communication’, ‘Management’ or ‘Assertiveness’. Additionally, they include widely used software technologies like “Microsoft Word” or “Microsoft Excel”. In contrast, “Specialised Skills” are those specifically required for more precisely defined tasks and associated with specific occupations. They are often referred to as technical or hard skills and include examples such as ‘Marketing’, ‘Risk Management’ or ‘Python’. Most vacancies require a combination of both specialised and common skills (see Table A2 in the Appendix for the distribution by occupations). In addition, the taxonomy groups skills into thematic groups by similarity.

To define our sample, we select job vacancies that list at least one required skill. This corresponds to over 93% of all job vacancies in each year analysed. We further refine the sample by including only vacancies with complete information on SOC codes and geographic location. The SOC codes are required for occupational classifications, whereas the geographic location is driven by the nature of our wider research project, which has a strong spatial interest. To reduce noise from small samples, we exclude occupations (4-digit) and skills that appear infrequently, with an observed frequency of less than 50 occurrences in both years. The number of job adverts (vacancies) and skills resulting from this process is shown in Table 1 (overleaf). We have a final sample containing more than 2.7 million job postings and 3,742 distinct skills.

Our final dataset contains a wealth of information about the types of jobs that are being advertised, the way that they are described and the skills that they require. We use this information to learn about the changes in skills that firms demand over the six-year period of our study. This is done with the caveat that the most recent information on skills that we have is derived exclusively from job vacancies advertised in 2022, which represent only a fraction of total employment. Nevertheless, the OECD (2022) reports that in Britain about 18% of workers have been in their job twelve months or less⁷, so they are likely to have the skills advertised in current or very recent job vacancies. We know from the work of Davis and Haltiwanger (1990) and other studies that followed⁸, that most job vacancies advertised are replacing departing employees and are not new additions to employment.

⁶ This is a transformer-based NLP model that can be used to match selected terms to skills from a standard list, such as the Lightcast taxonomy. More information in the Appendix.

⁷ The latest year of data is 2022.

⁸ A very large literature followed Davis and Haltiwanger’s seminal study, measuring job turnover in several countries. For a review of a large part of this literature, see Davis and Haltiwanger (1999).

So, although our data cannot distinguish between vacancies that are net additions to employment or replacements, it is reasonable to assume that the skills required by the advertised vacancies also reflect the skills that employers expect from their current workforce.

Table 1 - The sample of job adverts and skills

	Number of ads		Number of skills	
	2016	2022	2016	2022
Initial sample*	2182001	2036750	4093	4070
1. After dropping ads with < 1 skill	2046091	1927677	4092	4070
2. After dropping ads missing SOC 4-digit occupation code	1635360	1463987	4046	4044
3. After dropping ads missing location code	1495016	1367753	4026	4036
4. After dropping occupations with ads < 50 in 2016 and 2022	1494533	1367245	4026	4033
5. After dropping occupations with low frequency (ads < 100 in 2016) and outlier growth rates	1493416	1365251	4025	4032
6. After dropping skills with ads < 50 in 2016 and 2022	1493416	1365251	3772	3779
7. Dropping skills tagged as certificates	1493398	1365228	3733	3740
Final sample	1493398	1365228	3733	3740

Source: Analysis of data provided by [Adzuna Intelligence](#)

* We do not show here the dropped repeated skill entries within adverts because they had no effect on the number of job adverts or skills carried forward.

Before we analyse changes in skills requirements, we give some facts about the distribution of skills in the nearly 1.5 million advertised job positions in our sample in each year, alongside some definitions for our subsequent analysis.

First, some broad facts. While there is some variation in the number of skills related to the job title and field, on average, 10 skills are listed in each job advert. Table 2 shows the ten most frequently mentioned skills. There is almost a complete overlap in the most popular skills in each year, although some minor changes in rankings are observed. ‘Assertiveness’, ‘Solutions Focused’ and ‘Data Analysis’ rank higher in 2022 than in 2016, all of which are related to the rising importance of data-driven and evidence-based work.

When looking at the thematic categories of skills, rather than individual skills, we show in Figure 1 (overleaf) that the most frequently mentioned categories reflect the fact that the British economy has become overwhelmingly a service economy, with sophisticated business and management service provision. In 2022 the most frequently mentioned skill category was ‘Business’ skills, appearing in 79% of online job vacancies. This includes

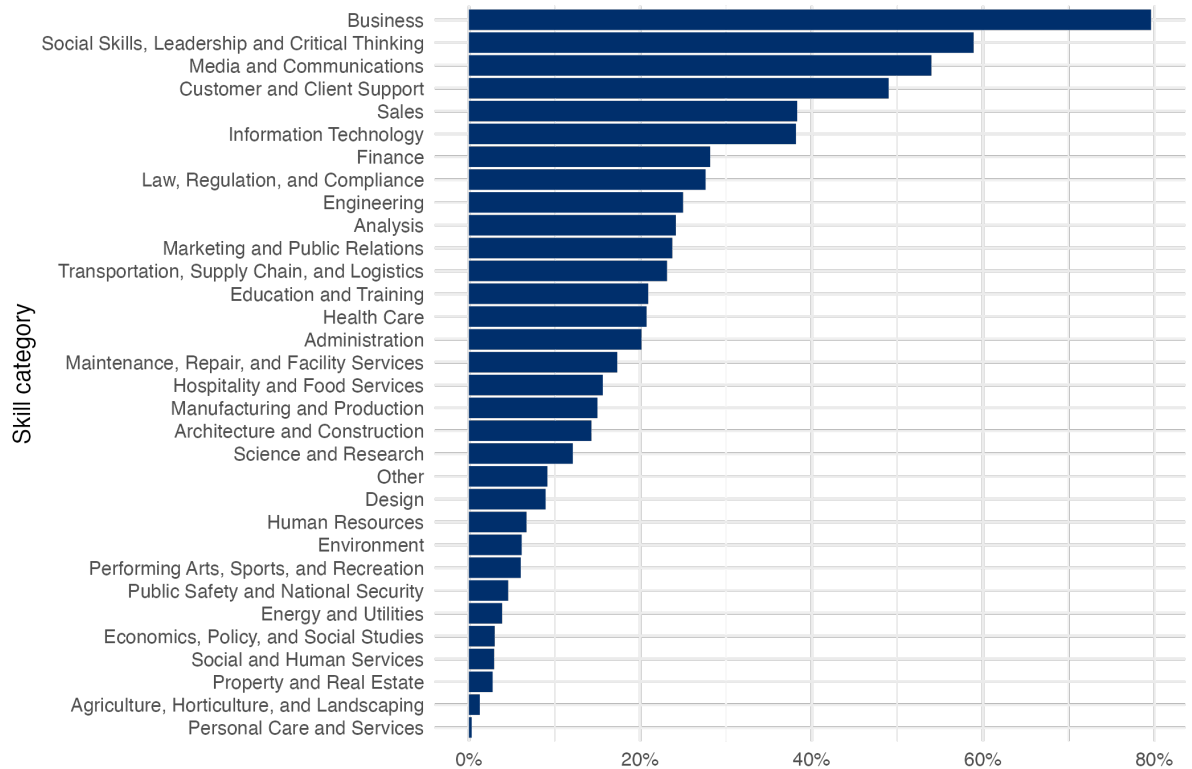
skills related to Management, Operations, Strategy and Consulting, among others. This is followed by ‘Social Skills, Leadership and Critical Thinking’, which appears in 59% of vacancies.⁹

Table 2 - The most popular skills

2016	2022
Communications	Communications
Management	Management
Client Services	Client Services
Sales	Assertiveness
Customer Service	Customer Service
Assertiveness	Solutions Focused
Solutions Focused	Data Analysis
Engineering Analysis	Sales
Data Analysis	Engineering Analysis
Retail Sales	Food Services

Source: Analysis of data provided by [Adzuna Intelligence](#)

Figure 1 - Most in demand skill thematic categories in 2022 (% of job postings)



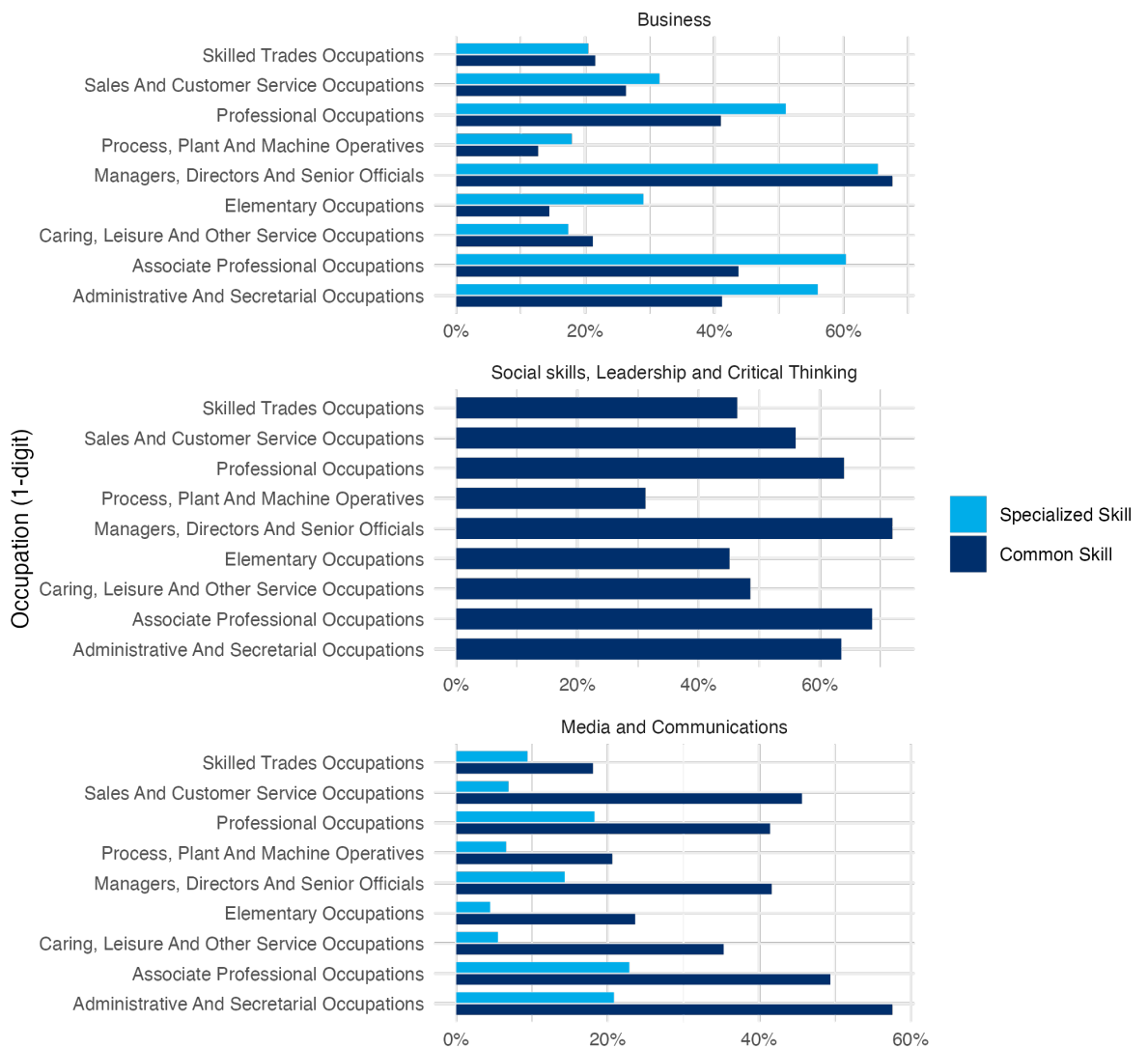
Source: Analysis of data provided by [Adzuna Intelligence](#)

⁹ Note that this category was originally referred to as ‘Physical and Inherent Abilities’ in the Open Skills taxonomy. We changed this label to one that we believe is more representative of its content.

This category includes skills related to critical thinking and problem solving, initiative and leadership, social skills, personal attributes and physical abilities. In third and fourth place we have ‘Media and Communications’ (54%), which includes communication, writing, presentation skills, and ‘Customer and Client Support’ (49%), which encompasses all client services, customer support and customer experience.

Looking at the distribution of the three most demanded skills categories across major occupational groups (Figure 2), we find that vacancies for Managers, Directors and Senior Officials require the highest share of Business skills and Social skills, Leadership and Critical Thinking skills. Skills in Media and Communication, particularly those that are common skills, are in high demand in Administrative, Associate Professionals and Sales occupations (at 1-digit level of SOC code). Conversely, Plant and Machine Operatives have the lowest requirements for these groups of skills, requiring more skills related to Construction, Transportation and Logistics instead.

Figure 2 - Most popular skill categories by major occupation groups (1-digit) in 2022 (% within group)



Source: Analysis of data provided by Adzuna Intelligence

Finally, to study changes in skill requirements we define the following skill types. To shed light on the rapid changes that are taking place, we define **emerging or new skills** as those mentioned at least three times more frequently in 2022 compared to 2016, whereas **disappearing or old skills** as those with half as many mentions in 2022 as in 2016, across all occupations. This approach and cut-offs are like those used by Deming and Noray (2020) in their analysis of the United States labour market, which we have adapted to our dataset.¹⁰

Once the new and old skills have been identified, we turn our attention to the ‘core skills’ within each occupation. To arrive at the core set of skills, given that job descriptions typically list more than one skill at a time (on average 10 skills), we first collect all the mentions of individual skills for all job postings within a 4-digit occupational code and rank them. We then define **core skills** as those that are mentioned in at least 20% of all job postings for each 4-digit occupation. Finally, skills that are not classified as new, old or core are referred to as ‘other skills.’ Figures 3a and 3b show the distribution of these skill types by thematic categories.

¹⁰ When defining old and new skills for cases in which a skill has no mentions in 2016 or 2022, we impose the restriction that the skill needs at least 100 vacancies mentioning it at the start or end year to be respectively categorized as an old or new skill. We use a higher threshold than the one that we used before to avoid an undue influence from small sample noise, given the zero entry in one year. Robustness is conducted by allowing different minimum vacancy thresholds and ratio of change, the results remain qualitatively similar.

Figure 3a – Types of specialised skills by thematic category (% within category)

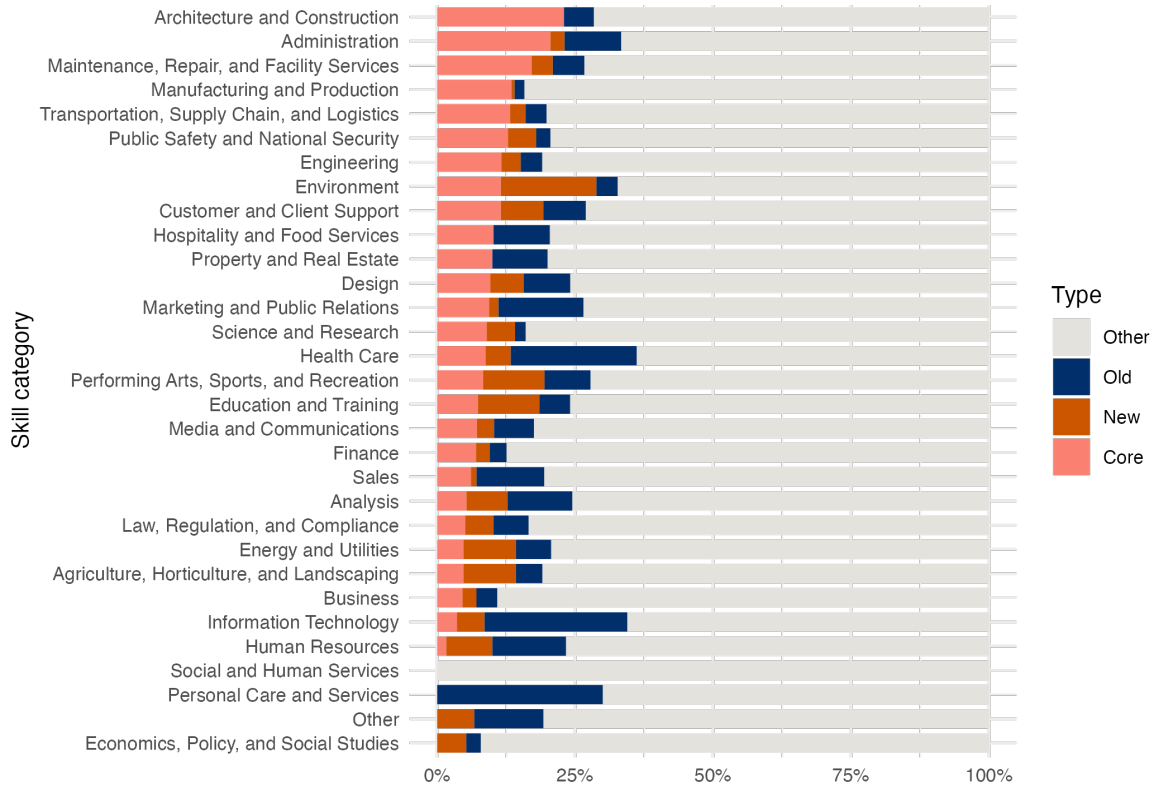
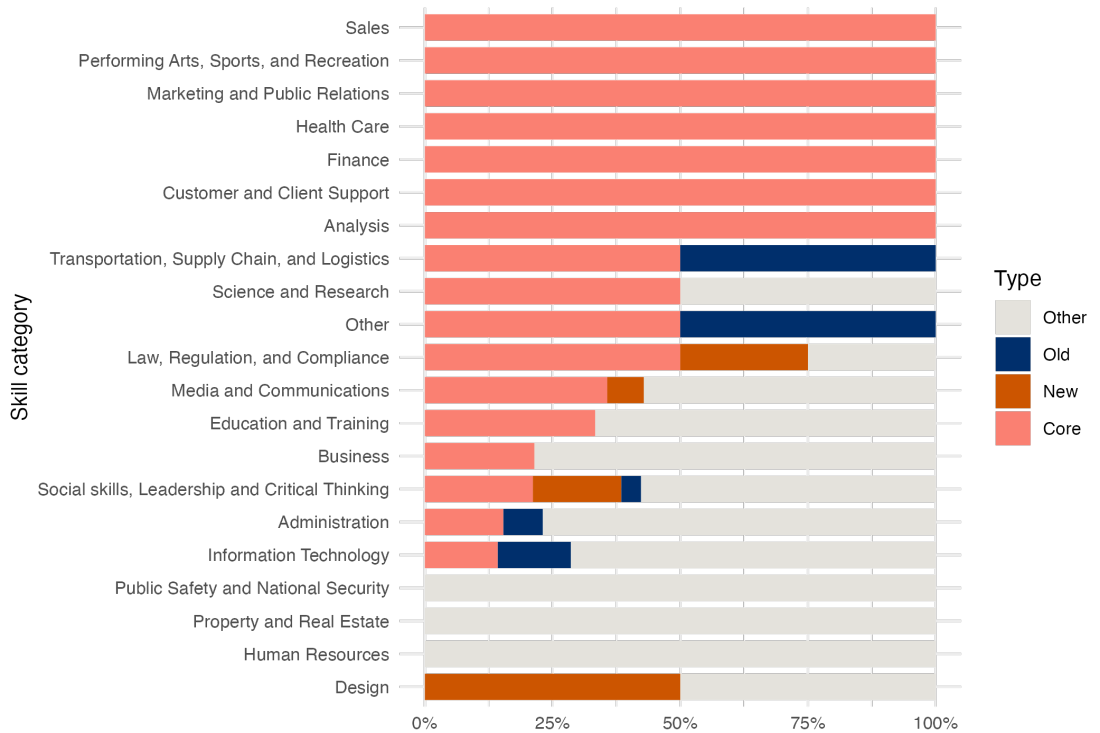


Figure 3b – Types of common skills by thematic category (% within category)



Source: Analysis of data provided by [Adzuna Intelligence](https://www.adzuna.com)

3. Emerging and disappearing skills

Using the method just outlined, we identify a total of 174 new skills and 437 old skills, collectively accounting for approximately 16% of all individual skills recorded. This number underscores the rapid changes in skills requirements that we have discussed. Given the large number of disappearing skills, and the short six-year period of our sample, the skills of large numbers of workers will be becoming obsolete over time, and the workers will need to train and retrain to progress their careers.

A review of the new skills that have emerged since 2016 reflects both the importance of new technologies and the shifting priorities in jobs. We observe that skills like ethical hacking, design thinking, deep learning, virtual learning environments, sustainable development, systems thinking, and artificial intelligence are ones that require good knowledge of digital technologies to do well, but they also have an ethical component. Conversely, many other skills have declined in relevance for employers during this period. These include skills such as internet marketing, call recording, recruitment advertising, phone sales and, sadly, academic writing. Ethical considerations seemed to be much less prevalent in 2016 than in 2022. Table 3 provides a list of the ten most frequently mentioned old and new skills, along with their respective respective categories.

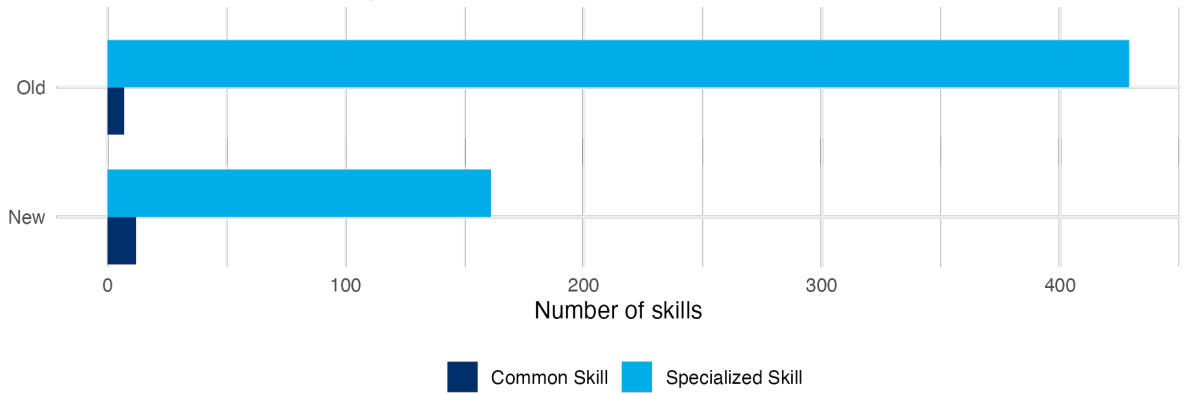
In 2022, 20% of vacancies mentioned at least one new skill, up from just 5.6% in 2016. In contrast, old skills follow the opposite pattern and were mentioned by less than 10% of vacancies in 2022, down from over 22% in 2016. Perhaps not surprisingly, most of the identified old and new skills are specialised (Figure 4), indicating that the most extreme transformations are driven by a growing demand for specialised expertise in various fields.

Table 3 – Top 10 old and new skills

Most mentioned old skills, 2016		Most mentioned new skills, 2020	
Skill	Category	Skill	Category
Microsoft SQL Servers	IT	Amazon Web Services	IT
Nursing Care	Health Care	Client Onboarding	IT
Telemarketing	Sales	DevOps	IT
PHP (Scripting Language)	IT	CI/CD	IT
Web Navigation	Other	Cyber Security	IT
Apple iOS	IT	Artificial Intelligence	IT
HTML5	IT	Talent Acquisition	Human Resources
Microsoft Windows	IT	Logical Reasoning	Social Skills, Leadership and Critical Thinking
Digital Media	Media and Comms	TypeScript	IT
Residential Development	Property and Real Estate	Machine Learning	IT

Source: Analysis of data provided by [Adzuna Intelligence](#)

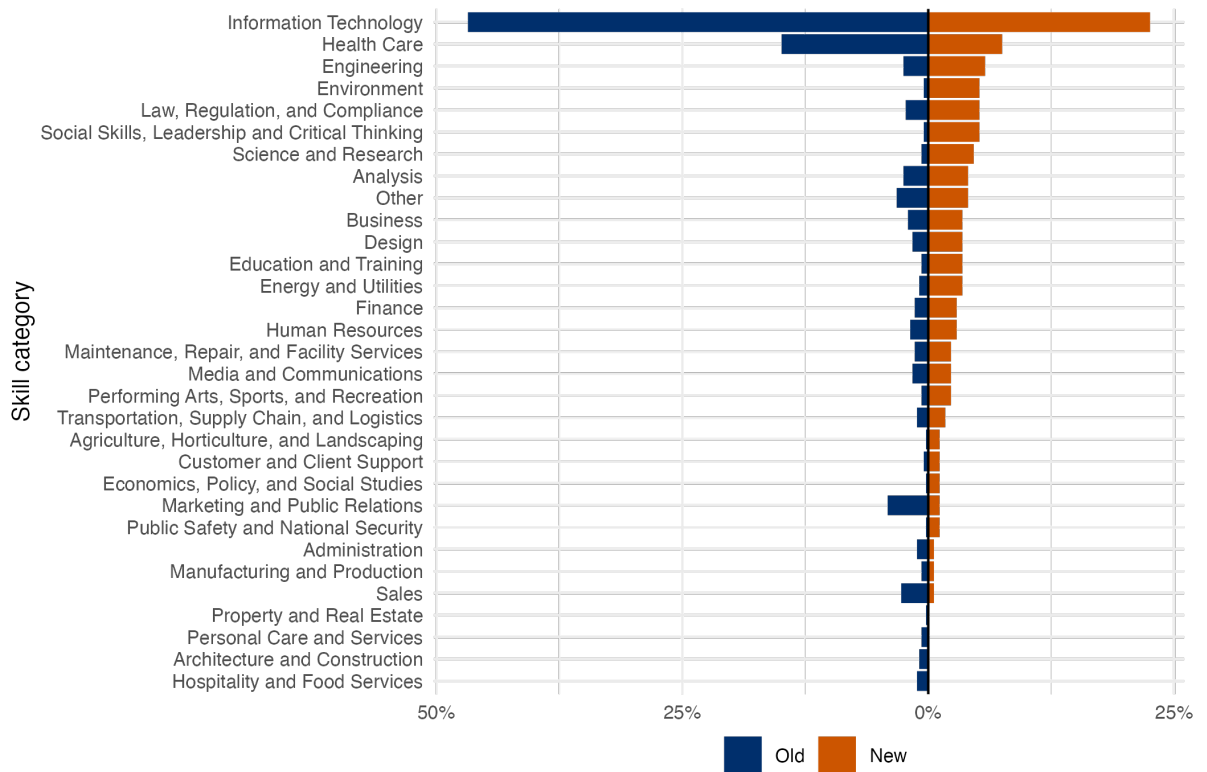
Figure 4 – The nature of new and old skills



Source: Analysis of data provided by [Adzuna Intelligence](#)

Most new and old skills are related to Information Technology and Health Care, as shown in Figure 5. These two thematic categories together account for nearly a third of the newly emerging skills and 61% of the old disappearing skills. However, it is worth noting that within these broad categories, there is great variation in the types of skills that are classified as new or old. Given that IT and the health sector are also two very active employment sectors in the labour market, the implication is that these sectors are changing very fast. This is intuitive for IT, which is the sector that experiences the most change due to rapid technological advances. That the health sector would be evolving fast as well might be due to shifting priorities because of Covid, which happened between the two years analysed. However, given how large the sector is and the new technologies that are continually developed in health, there might be other forces at play as well.¹¹

Figure 5 - Main thematic categories of new and old skills



Source: Analysis of data provided by [Adzuna Intelligence](#)

Note: This figure shows percentages with reference to the group of old and new skills, respectively. This figure omits ‘Social and Human Services’ because there were no old or new skills in this thematic category.

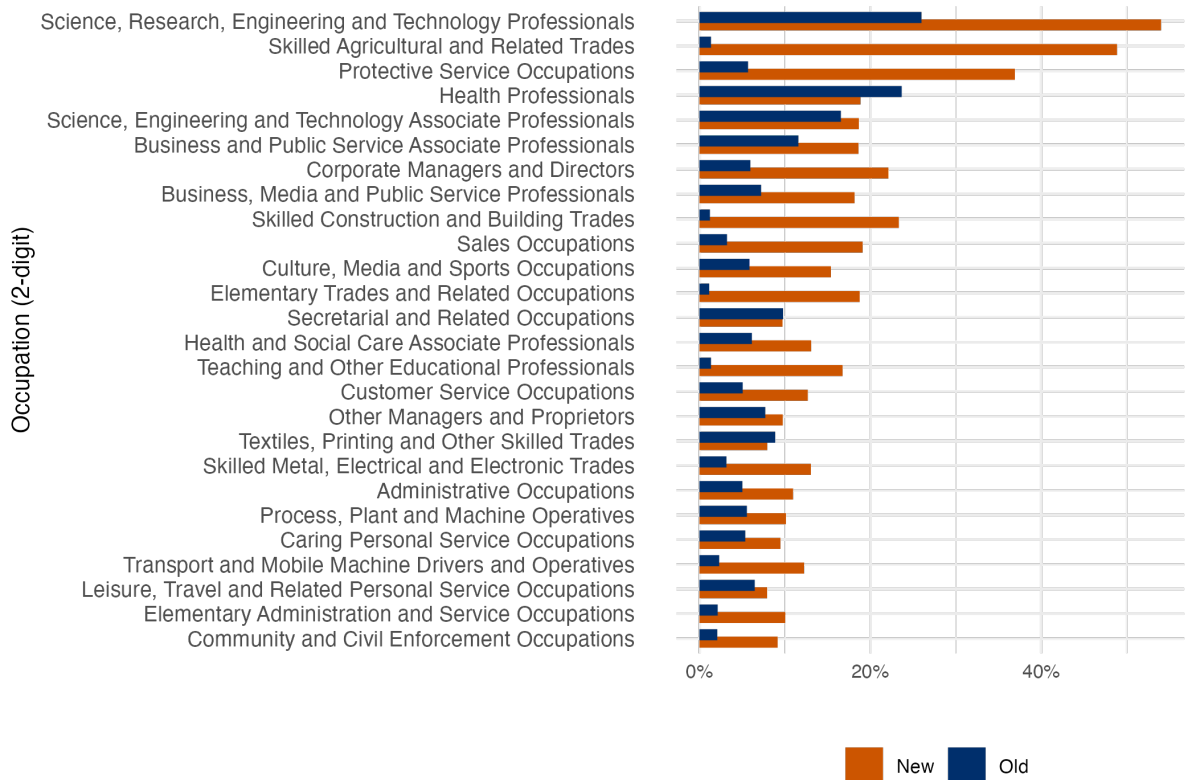
¹¹ See for example, Vidal-Alaball et al. (2023).

A more granular analysis of IT skills shows that Cybersecurity, Data Science, AI and Cloud Solutions are emerging as new skills. This reflects the industry’s response to increasingly complex technological challenges and opportunities that come with the rapid development of AI applications. Conversely, many of the old skills in IT are in the subcategories of Software and Microsoft Development Tools, Databases and Operating Systems, where new and alternative tools have become more prevalent, reducing demand for older technologies.

Beyond IT and Health Care, other important categories for new skills are Engineering, Environment and Social skills, Leadership and Critical Thinking. As noted before, Social skills, Leadership and Critical Thinking is an umbrella term that encompasses a variety of social and interpersonal skills, personal attributes and physical abilities. Examples of emerging skills within this category are ‘Critical Thinking’, ‘Motivational Skills’, ‘Logical Reasoning’, ‘Creativity’ and ‘Resilience’. This is aligned with other work showing the growing importance of these kinds of skills (e.g. Dickerson et al., 2023). Meanwhile, a large share of old skills is found in Marketing and Public Relations and Sales.

Considering the previous findings on categories and subcategories, Figure 6 shows that a large proportion of postings for Science, Research, Engineering and Technology jobs require new skills. In this occupational group (2-digit SOC code), we have professions such as cybersecurity professionals, programmers and software developers, and IT business analysts. Equally, a large share of old skills is also still required in these occupations, in jobs such as programmers and software development professionals, suggesting an overlap in major occupational groups experiencing fast emerging and disappearing skills.

Figure 6 - New and old skills by occupation (2-digit SOC code) in 2022 (% within group)



Source: Analysis of data provided by [Adzuna Intelligence](#)

4. Which jobs are changing the most?

In this section, we focus on which jobs have undergone the most notable (and fastest) transformations since 2016 and what types of skills are at the forefront of this change.

We measure the ‘occupational skill share’, which is the share of vacancies within each SOC 4-digit occupational group that mention each specific skill. In essence, it quantifies the importance of a particular skill for each occupation – this assumes that the higher the number of job ads mentioning a particular skill for a given occupation, the higher its importance. The use of the text of job descriptions to arrive at these skill shares and their changes over time allows us to interpret them, albeit cautiously, as a proxy for demand for a given skill.

To quantify the changes in skills requirements across occupations, we calculate the difference in skill shares between 2016 and 2022. The net change is simply the difference between shares of vacancies mentioning a particular individual skill between the two years. We differentiate between positive and negative changes, that is, net increases and decreases in skills requirements. The skill turnover – or gross change in shares - is the absolute value of these differences in shares. This measure shows the change in the demand for a skill in either direction, being also a measure of disruption in the occupation. Workers employed in an occupation with high turnover are expected to have to adjust more, either learning new skills or having to stop using some of their old skills.

Key Indicators of Skills Change

We use two indicators to quantify how occupations are changing: net change and gross change, building on the approach by Deming and Noray (2020). Let the share of job ads mentioning a specific skill (s) for a given occupation (o), out of all adverts (vacancies) posted for occupation (o) in year (t), be defined as:

$$\text{Share Skill}_{(s,o,t)} = \frac{\text{Number of Job Ads}_{(s,o,t)}}{\text{Number of Job Ads}_{(o,t)}}$$

We compute the net change in the share of job ads mentioning a specific skill within an occupation between two years as:

$$\Delta_t \text{Share Skill}_{(s,o)} = \text{Share Skill}_{(s,o,t_1)} - \text{Share Skill}_{(s,o,t_0)}$$

This includes imputed zeros in the calculations (for emerging/ disappearing skills).¹² These changes in shares can be positive or negative, reflecting an increasing or a decreasing importance of the skills.

¹² Following Deming and Noray (2020), and in order to adjust for changes in writing and length of job ads across years which can mechanically inflate or deflate the number of mentions per vacancy, we rescale the equation by multiplying it by the inverse ratio of the average number of skills per job ad of a given occupation in end (t_1) and start (t_0) periods:

$$\text{Average Number of Skills per Job Ad}_{(o,t_0)} / \text{Average Number of Skills per Job Ad}_{(o,t_1)}$$

In addition, the calculated shares do not necessarily sum to 1. This is because vacancies usually demand a blend of skills. When calculating shares our numerator is the number of vacancies requiring skill (s) in occupation (o), and our denominator the total number of vacancies in occupation (o). For example, in the occupation “IT manager” 60% of vacancies may require “business skill” and 50% may require “IT skills.” If each and every vacancy requires at least one of those skills, the sum of their shares is 1.1 because 10% of them request both. The **gross change** in shares is defined as the *absolute* change, positive or negative:

$$|\Delta_t Share Skill_{(s,o)}| = |Share Skill_{(s,o,t_1)} - Share Skill_{(s,o,t_0)}|$$

Figure 7 shows the level of skill turnover by occupation (at 2-digit SOC code level). Among these occupational groups, the highest skill turnover (gross changes) is seen in Protective Service professionals, followed by Science, Engineering, Technology professionals and associates. On the flip side, the slowest changes are observed among Teaching professionals, Textiles, Printing and other skilled trades and Transport operators.

Figure 7 - Skill Turnover, by occupation (2-digit SOC code) 2016 - 2022

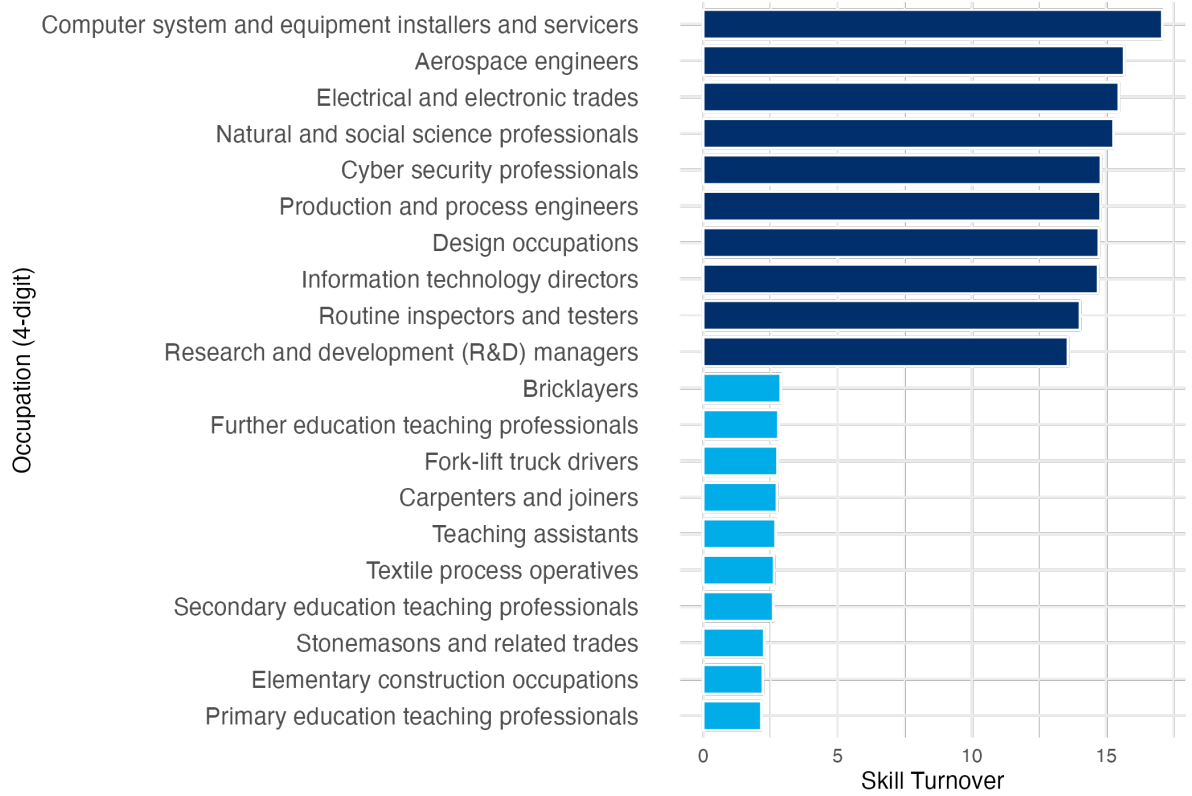


Source: Analysis of data provided by [Adzuna Intelligence](#)

In terms of specific occupations (at 4-digit SOC code level), the fastest-changing occupations between 2016-2022 include computer system and equipment installers, electrical trades professionals, aerospace engineers and design occupations, as shown in Figure 8. A more detailed analysis reveals that these jobs are increasingly demanding specialised skills in areas like cybersecurity and network security, electrical and computer engineering, circuitry, data analysis and UI/UX design. In terms of common skills, these jobs are increasingly requiring critical thinking skills and initiative and leadership skills.

On the other hand, among the slowest-changing occupations we observe teaching professionals, elementary construction workers, elementary trade occupations (stonemasons, carpenters) and machine operatives.

Figure 8 - Occupations (4-digit SOC code level) with largest and smallest skill turnover



Source: Analysis of data provided by [Adzuna Intelligence](#)

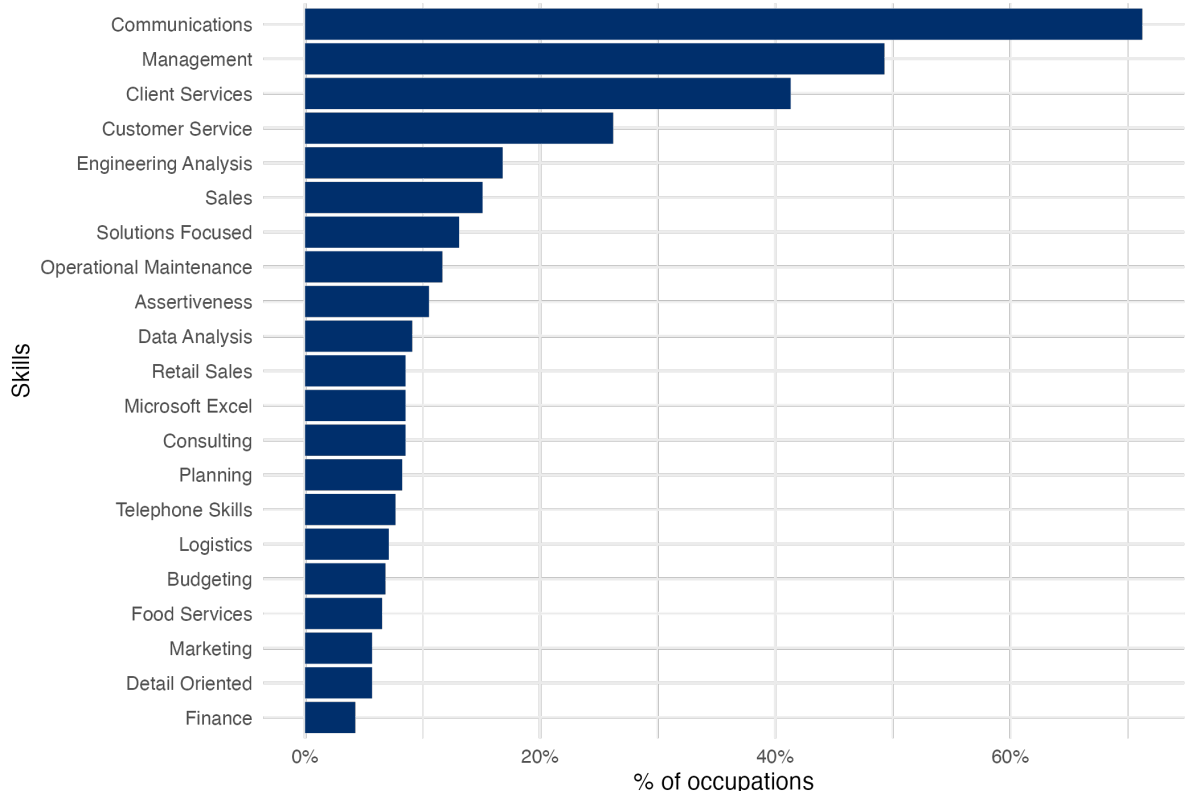
5. The importance of core skills

Shifting focus from the emergence of new skills or the disappearance of older ones, we take a closer look at the ‘core’ skills required in various occupations.

As mentioned before, core skills are the most frequent skills mentioned for each occupation, defined as skills that appear in at least 20% of job adverts within each SOC 4-digit occupation. Interestingly, the set of core skills for most occupations seldom overlaps with the skills identified as new or old skills.¹³ We find that changes within the group of core skills account for the most significant shifts in skills requirements in the period analysed.

Among skills identified as core, the majority (88%) are specialised and the remaining (12%) are common skills. The most mentioned skill, ‘Communication’ is a core skill for most occupations. As shown in Figure 9, ‘Communication’ appears as a core skill for 250 occupations, meaning it is highly important for over 70% of all occupations analysed (at the 4-digit SOC level). In second place is ‘Management’, which is a core skill in 49% of occupations, followed by ‘Client Services’, a core skill in 41% of occupations. Among the top 20 most frequently mentioned core skills, the one with the lowest representation across occupations is ‘Finance’, appearing as a core skill in only 15 occupations (4%).

Figure 9 – Top mentioned core skills, prevalence across occupations



Source: Analysis of data provided by [Adzuna Intelligence](#)

Note: This figure shows the share of 4-digit SOC occupations (in total 351) for which each individual skill is a core skill, that is, appears in at least 20% of postings for this specific occupation. This figure includes the 20 top mentioned individual skills (in terms of job postings).

¹³ There are some small exceptions, with a small overlap between old, new, and core skills with less than 5% of old skills and 4% of new skills being simultaneously labelled as core in 2016. For the decomposition analysis that follows, when such overlaps occur, we classify the skill as old or new, rather than core.

We also find that 14% of all job postings mention a specialised core skill in the category Customer and Client Support. The other major thematic categories of specialised core skills are Engineering (12%) and IT (10%). Among the common core skills, we see that a large share of job postings contains core skills in Media and Communications (28%) and Business (19%) and Social skills, Leadership and Critical Thinking (17%).

It is notable that some key sets of core skills have been growing at a very fast pace. Some examples of very fast-growing core skills are shown in Table 4.

As shown in Figure 10, skills in the subcategories of Data Analysis, Query Languages, Auditing and Java have gained importance over the period, being mentioned in many more job postings in 2022 than in 2016.

In terms of individual specialised skills that gained importance, some examples are ‘SQL’ (+3pp) and ‘Forecasting’ (+4pp).

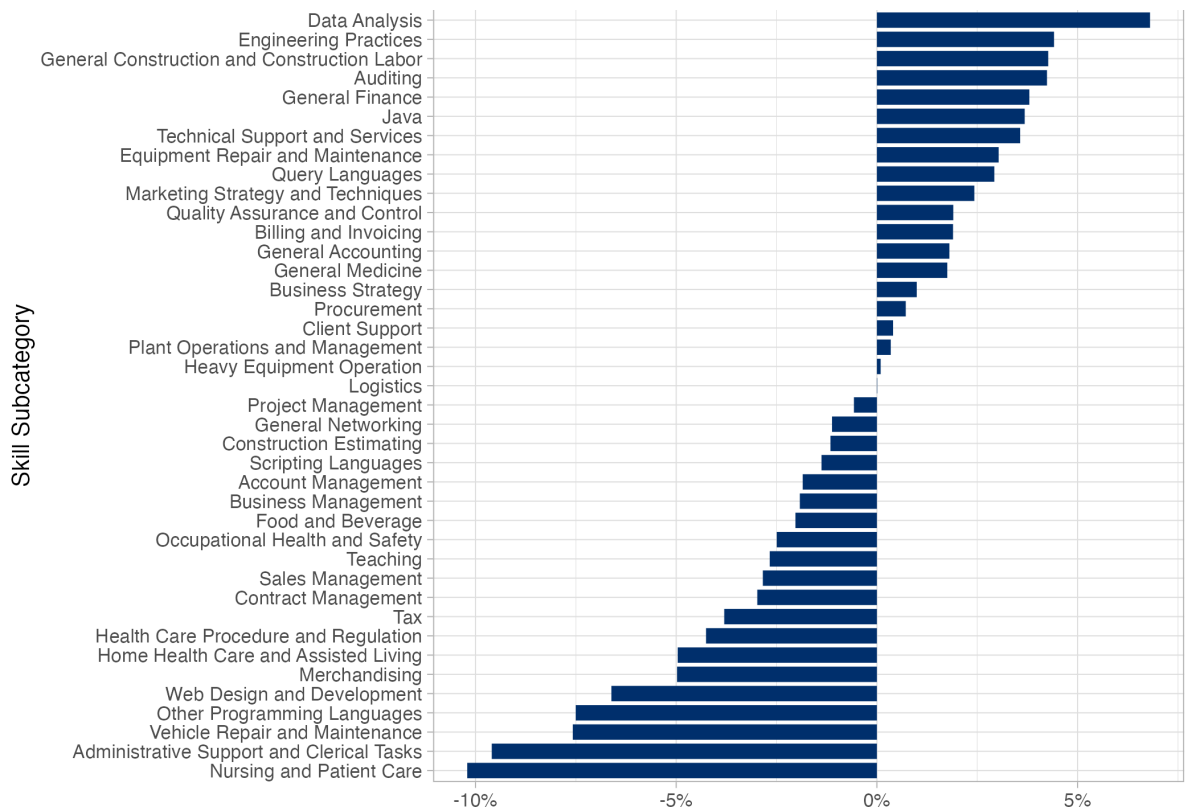
Table 4 - Fast growing core skills

Skills
Software Engineering
Data Analysis
Solutions Focused
Python (Programming Language)
Architectural Design
Strategy Execution
Hospitality
Communications
Computer Programming
Problem Solving

Source: Analysis of data provided by [Adzuna Intelligence](#)

Note: This considers individual skills with more than 2,000 mentions in both years analysed.

Figure 10 – Changes in mentions of core specialised skills (% job postings)



Source: Analysis of data provided by [Adzuna Intelligence](#)

In terms of common core skills (Figure 11), we see a rapid increase in the demand for Initiative and Leadership (e.g. ‘Solutions Focus’ +7pp), Social Media and Communication. At the same time, there has been a decline in the demand for Retail Sales skills and Basic Technical Knowledge. This decrease could be suggestive of a shift towards new automation technologies, which are replacing tasks these skills were primarily used for, or of changes in recruitment methods.

Figure 11 – Changes in mentions of core common skills (% job postings)

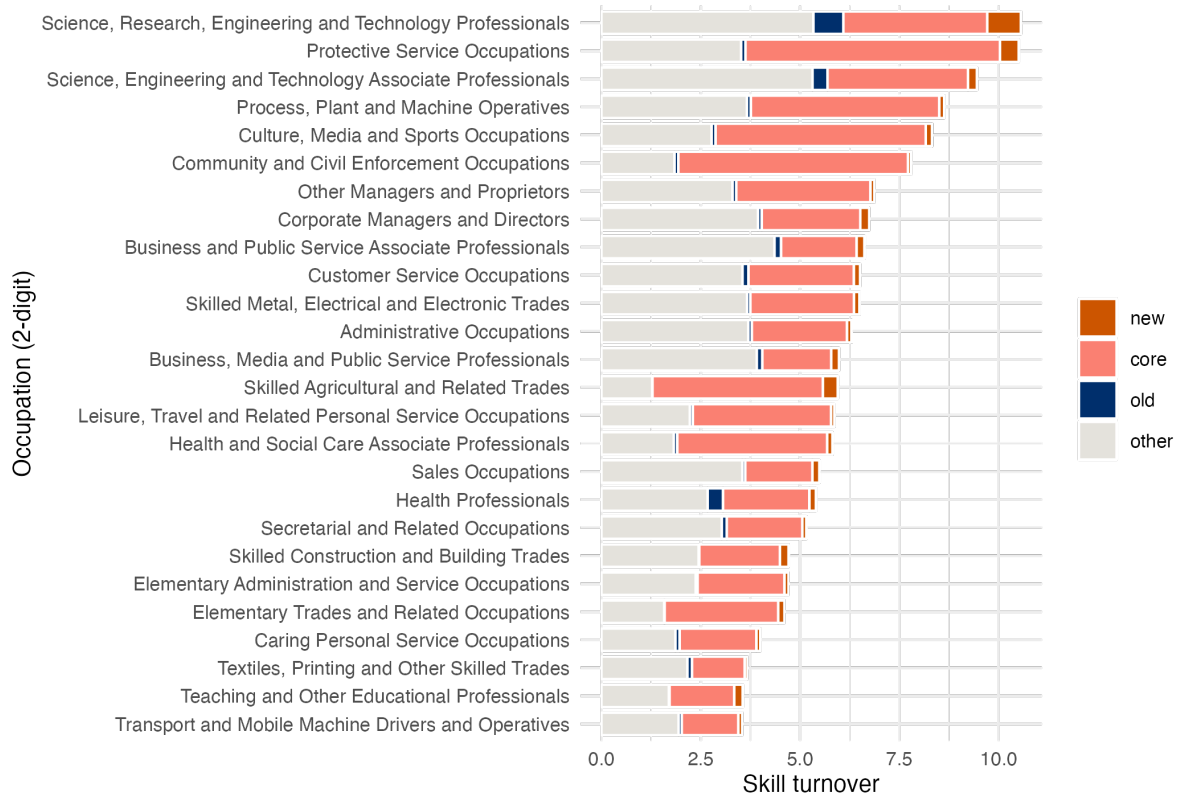


A decomposition exercise allows us to examine how much of skill turnover is explained by shifts in core skills, in comparison to those arising from new and old skills.

Figure 12 (overleaf) presents the results of this decomposition of the total skill turnover for 2-digit SOC code level occupational groups. Importantly, across all groups, the greatest contributor to skill turnover are the changes in core skills.

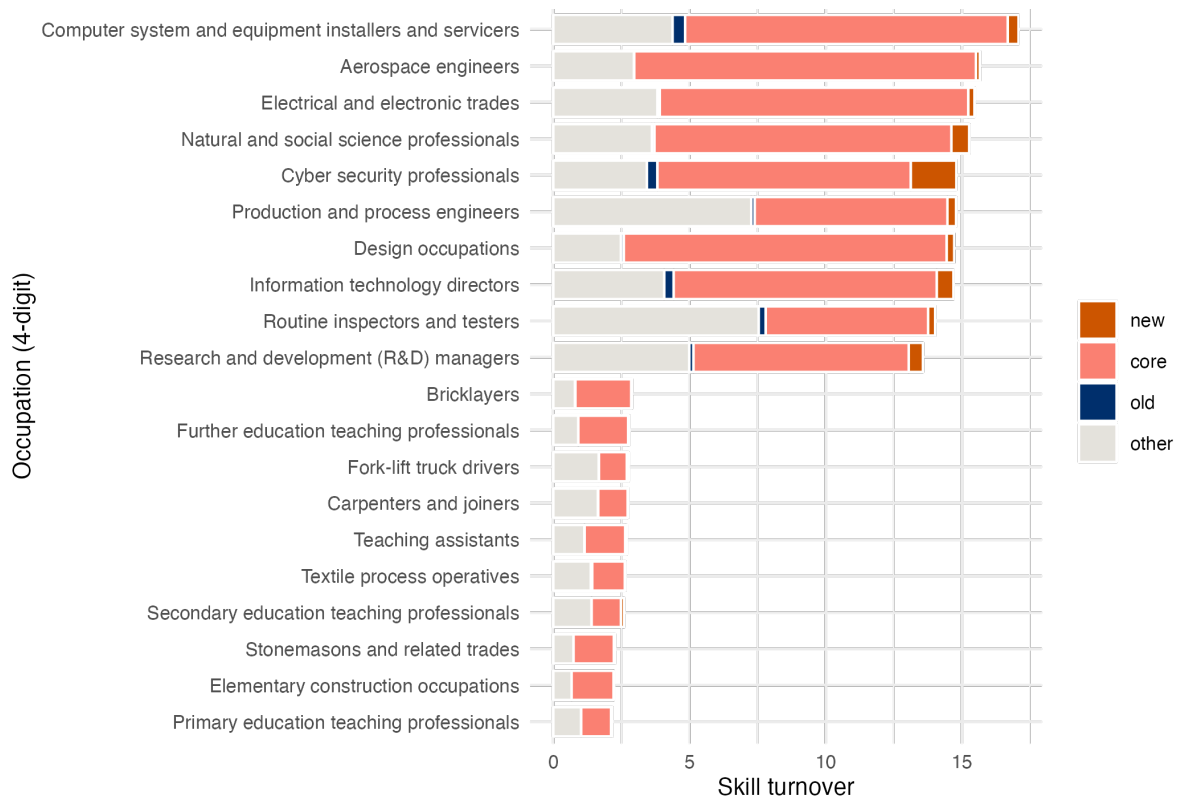
In Figure 13 (overleaf), we present the decomposition results for the slowest and fastest-changing occupations (at 4-digit SOC code level).

Figure 12 - Decomposing skills turnover into new, old and core skills



Source: Analysis of data provided by [Adzuna Intelligence](#)

Figure 13 - Decomposing skills turnover for occupations (4-digit SOC code level) with largest and smallest turnover



Source: Analysis of data provided by [Adzuna Intelligence](#)

6. Deep dive: technology skills

We have argued that the biggest changes that we observe in skills are in the technology sector. Technology skills are defined as skills belonging to two thematic categories, namely Analysis and Information Technology. These skills are the ones that are needed to work with the most modern digital technologies, and as such attract more interest than any others.

Within the Analysis and IT categories, we have a wide range of advanced specialised skills. For example:

- **“Analysis”**: *data analysis, data science, data visualisation, image analysis, maths and mathematical modelling, statistical software, NLP, business intelligence...*
- **“Information Technology”**: *API, AI and machine learning, programming languages, cloud computing, computer science, data collection and storage, databases, IoT, IT automation, IT management, cybersecurity, network security, telecoms...*

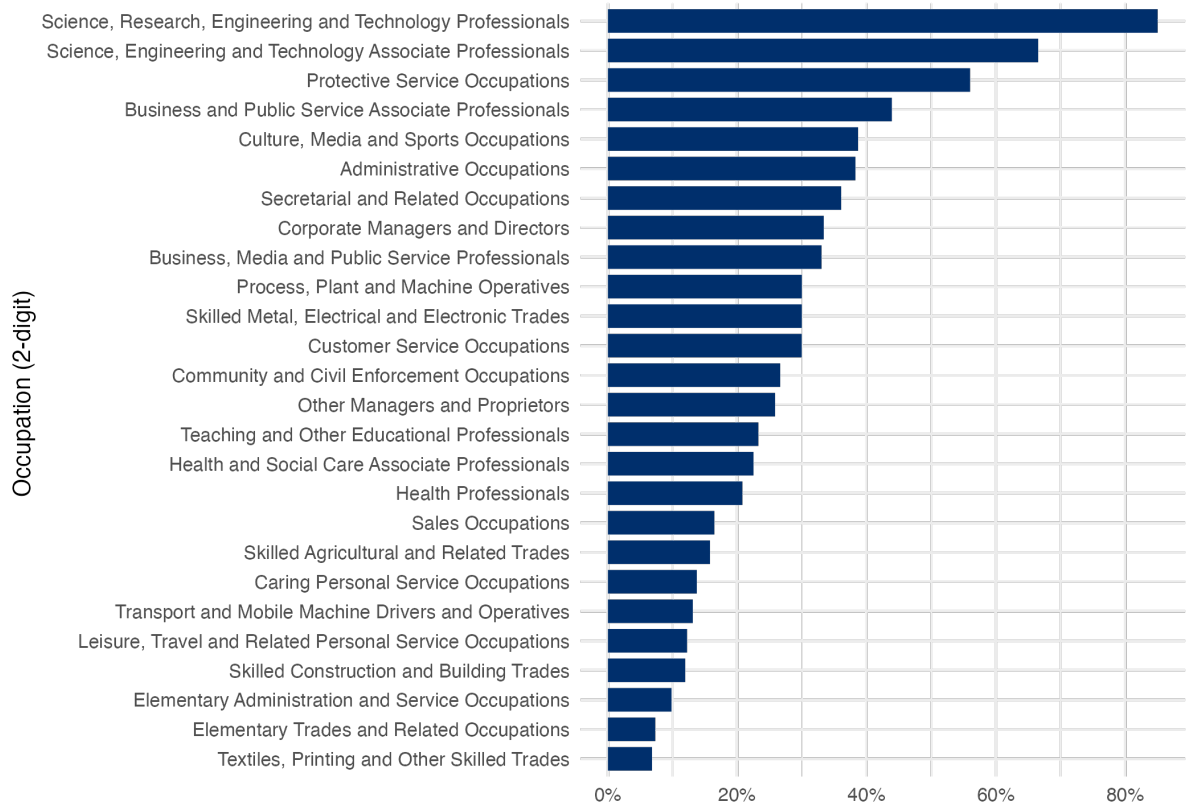
Across the board, 35% of vacancies in 2022 included at least one IT skill and 23% at least one analysis skill. Among the most popular IT skills we have ‘Computer Literacy’, ‘Computer Programming’, ‘SQL’ and ‘Databases’. In Analysis, we have ‘Analytics’, ‘Data Analysis’, ‘Forecasting’ and ‘Business Intelligence’.

Technology skills related to the development and adoption of AI systems and applications are becoming increasingly important. This includes skills in programming languages such as Python, understanding and implementing AI models such as deep learning and neural networks, as well as proficiency in AI-specific software and frameworks that use machine learning.

The frequency of mentions of IT and Analysis skills in job adverts varies considerably by occupation (at 2-digit SOC code level) - see Figures below. Science, Research, Engineering and Technology Professionals stand out with a remarkably high percentage of both IT (85%) and Analysis skills (42%). This is perhaps unsurprising given that these occupations are technology-intensive and require strong analytical skills. Among professions in this category with the highest share of job postings that mention an IT skill we have cybersecurity professionals and software development professionals (>97%).

We also observe that even beyond the traditionally tech-intensive professional occupations, IT and Analysis skills are very relevant for employers, such as for roles in Corporate Managers and Directors, Business and Public Service Professionals and Administrative occupations.

Figure 14 - Percentage of job postings with at least one IT skill in 2022, by occupation (2-digit SOC code level)



Source: Analysis of data provided by [Adzuna Intelligence](#)

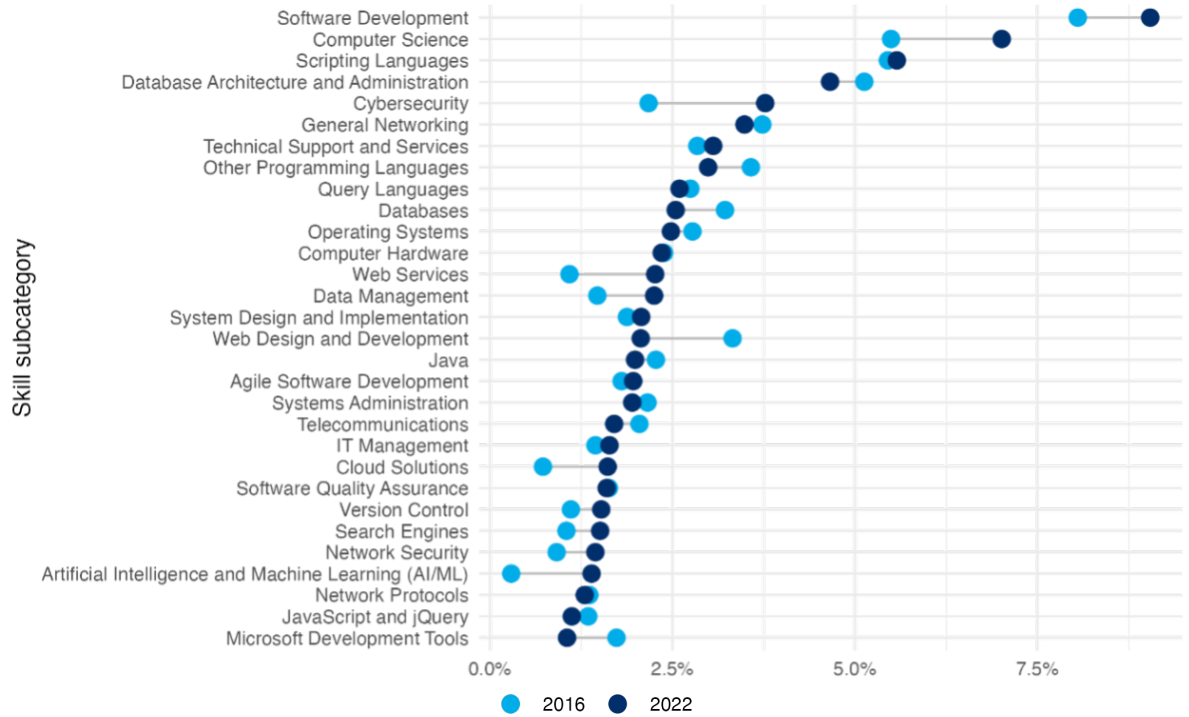
Figure 15 - Percentage of job postings with at least one Analysis skill in 2022, by occupation (2-digit SOC code level)



Source: Analysis of data provided by [Adzuna Intelligence](#)

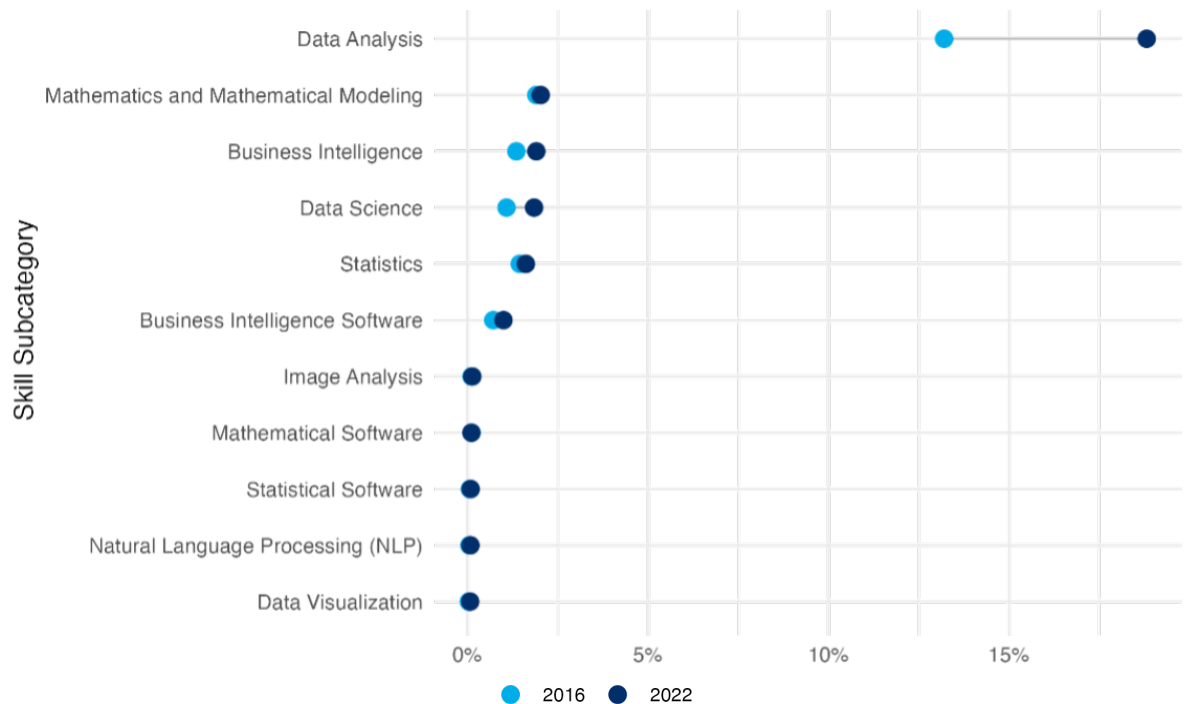
Examining the change in demand for tech skills from 2016 to 2022, we observe that dominant subcategories like Software Development, Computer Science and Data Analysis have maintained their prominence, which indicates that there is stable (and growing) demand for these skills. It is interesting to observe the increase of some specific groups of skills – for example, large changes are observed in Cybersecurity, Cloud Computing, AI and Machine Learning, aligning with shifts towards these technologies.

Figure 16 - Change in IT skills since 2016 (% job postings)



Source: Analysis of data provided by [Adzuna Intelligence](#)

Figure 17 - Change in Analysis skills since 2016 (% job postings)



Source: Analysis of data provided by [Adzuna Intelligence](#)

Approximately 9% of all job adverts in 2022 mentioned at least one new IT skill or one new analysis skill in their job description.

Table 5 reveals the top ten occupations (at 4-digit SOC code level) that have experienced a particularly rapid increase in the demand for new technology skills. Among these jobs, we have cybersecurity professionals, programmers and software development professionals, IT business analysts, architects and systems designers, IT quality and testing professionals, security system installers and repairers, directors in consultancy services, IT managers, data analysts, architects, and photographers, audio-visual and broadcasting equipment operations.

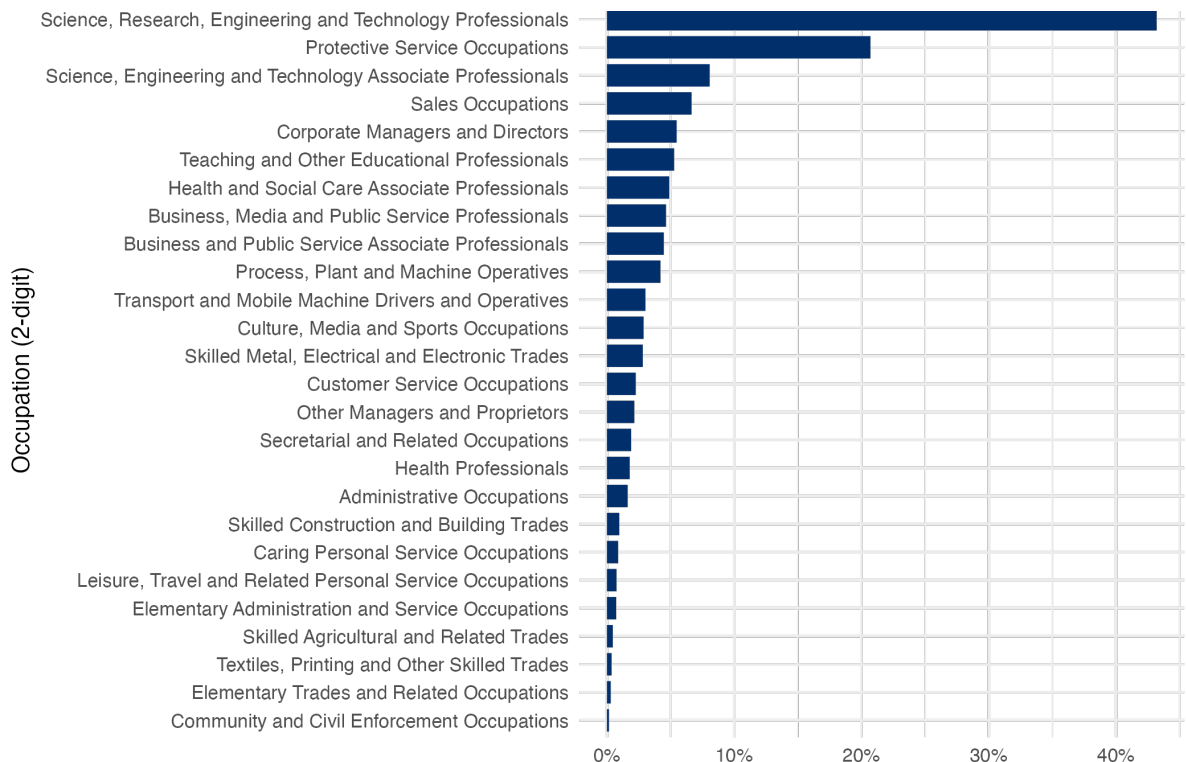
As shown in Figures 18 and 19, these new technology related skills are relevant across many occupational groups (2-digit SOC code level), and particularly so for Science, Research, Engineering and Technology professionals, for which 40% of job postings mention new IT skills and 5% a new analysis skill. We also observe a high demand for new IT skills in protective service associate jobs and that in adverts for health professionals, managers and directors and business professionals, new analysis skills are more frequently mentioned.

Table 5 - Occupations with the fastest increase in demand for new tech skills

Occupation (4-digit SOC code level)
Cyber security professionals
Programmers and software development professionals
IT business analysts, architects and systems designers
IT quality and testing professionals
Security system installers and repairers
Directors in consultancy services
IT managers
Data analysts
Architects
Photographers, audio-visual and broadcasting equipment operations

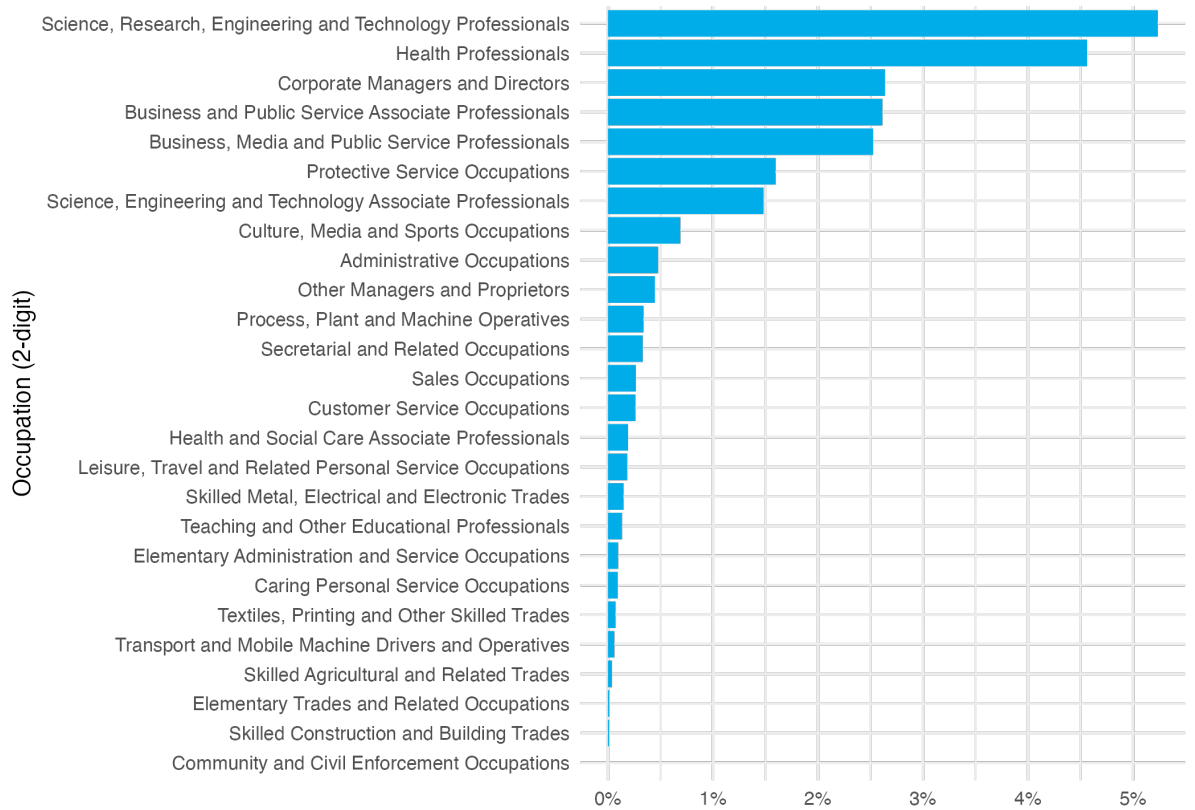
Source: Analysis of data provided by [Adzuna Intelligence](#)

Figure 18 - Job postings mentioning at least one new IT skill in 2022, by occupation (2-digit SOC code level)



Source: Analysis of data provided by [Adzuna Intelligence](#)

Figure 19 - Job postings mentioning at least one new Analysis skill in 2022, by occupation (2-digit SOC code level)



Source: Analysis of data provided by [Adzuna Intelligence](#)

7. Conclusions

We have made use of a comprehensive dataset of advertised job vacancies over the period 2016 to 2022, provided by Adzuna, to learn about the skill requirements of British companies. Adzuna collects online job advertisements, covering over 90% of job vacancies in the United Kingdom. After cleaning the data and removing adverts with insufficient information, we analysed approximately 1.4 million job vacancies per month between 2016 and 2022, encompassing about 3,500 different skills.

Our focus was on the changes in skill requirements between the two end years, studying the skills requested by employers in September 2016 and in September 2022, and comparing them. We chose the month of September as it is relatively free of seasonal effects and public holidays. Given our source for this study, our analysis focuses on the skills required by companies, in their own words, and does not inquire if workers have the ability to perform these tasks, or if companies are successful in their recruitment efforts.¹⁴ We are primarily concerned with identifying the skills workers need to succeed in the labour market. This applies to new entrants seeking their first job as well as established workers aiming to advance their careers. Accompanying work from the Review will address the question of enablers and institutional structures for the education and training programmes, and the capabilities and approaches by firms and their workers in their efforts to successfully transition to the skillsets highlighted by our study.

In this report, we have identified a set of “core” skills that are frequently mentioned in each occupation, as well as a set of rapidly emerging and disappearing skills. Despite many changes in skill requirements between 2016 and 2022, by far the largest group of skills are the core ones; most skills that were core in 2016 continue to be so in 2022. Changes within this group of skills - reflected in the varying shares of job adverts mentioning these skills between the two years - account for most of the shifts in skills demand.

The most popular core skills that firms persistently request are good communication skills (with at least 20% of job adverts requiring it in 250 out of our 351 4-digit SOC code level occupations), good management abilities, and client or customer services. Combining client and customer services, as they both relate to the firm’s service base, their combined prevalence is close to that of communication skills. Thus, the skill most sought-after by British employers is the ability to communicate effectively with colleagues, clients, and the market and social space within which the company operates. It might be comforting to note that these are skills that primarily require good traditional knowledge, such as good English and effective writing and speaking abilities. However, other knowledge that could improve these sought-after skills, like basic sociology and psychology, are generally absent from school curricula and, most likely (although precise data are lacking), from company training programmes as well.

¹⁴ For analysis of workers’ capabilities and employers’ attitudes see parallel work by Magdalena Soffia et al. (2024) and James Hayton et al. (2023)

About 16% of skills are either skills that rapidly increased between 2016 and 2022, or skills that are becoming less relevant for employers over this period. The occupations requiring these skills are ones that are experiencing the most changes due to the introduction of new technologies. Therefore, it is not surprising to find that the occupational group (2-digit SOC code level) that has lost the most skills and gained the most new skills is Science, Engineering, Technology Professionals and Associates. Looking at the thematic skills categories, the skills that have undergone most changes are those related to IT. In 2016, the main IT skills demanded seem simple by today's standards, such as working with Microsoft, telemarketing and web navigation. In contrast, the emerging skills in 2022 reflect more specialised competencies, such as Amazon web services, cybersecurity, and AI and machine learning.

We found large variation in the pace of change (skill turnover) across occupations and noted that the most significant changes in skills are occurring due to shifts in core skills. The fastest changing occupations include computer system and equipment installers, electrical trades professionals, aerospace engineers and cybersecurity professionals. Conversely, the slowest changes in skill requirements are observed among Teaching professionals, Textiles, Printing and other skilled trades and Transport operators.

A closer examination of this reveals that rapid skills changes are also closely related to IT. Symbolic of this rapid change is the fact that new skills – such as the ability to use tools such as ChatGPT or Copilot - only emerged after our most recent data was available. Clearly, further work on the disrupting impact of generative AI on skills demand will need to be done; our work suggests that an important focus will be whether the use of more advanced large language models impacts the demand for core human communication skills.

It is clear from our research that the most substantial changes taking place along any dimension one might look – emergence of new skills, disappearance of old skills or quantitative changes in popular skills both at the start and end of our period – are in occupations associated with IT and advanced data analytics. A common observation that in recent years access to data is becoming the key resource for companies seeking to expand in the high-tech sectors (and beyond) is confirmed by the data on online job vacancies used in our study.

Despite the very rich and comprehensive dataset that we have used, there are some limitations that we should point out. Adzuna collects data of online job adverts only, and despite its near universal coverage, there might be omissions that are not randomly distributed. For example, some types of manual jobs may not be listed at the same frequency as professional jobs in IT. Similarly, the reasons that employers advertise a job may vary across occupations and some may not reflect actual job openings. Some employers may not explicitly mention skills that are commonplace or implicit in the jobs that they are advertising, as for example, physical, routine or more basic digital skills like computer literacy. Finally, we have limited ourselves to one month's job vacancies in 2016 and the same month's vacancies in 2022. But for some occupations this may be at a disadvantage, as for example, hospitality, which is much more active in the summer, and health, which is much more active in winter.

But there is no escaping the fact that the findings of this report support the need for policies that encourage continuous learning and skills development, particularly in technology-

related areas. For this to happen, it is important to review educational programmes to equip future workers with the most relevant skills, but also to provide ongoing support for adults and transitioning workers to update their skillsets. The detailed findings around new and old skills, as well as core skills that are experiencing growing demand, can be useful for workers seeking to navigate these changes, but also for educators and policymakers who need to plan for the future. They provide information that can be used to align training and educational programs with the dynamic needs of the labour market, ensuring that the UK workforce remains equipped with relevant skills.

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Appendix

Data curation

To enable the classification of skills into thematic categories, we map the individual skills extracted by Adzuna (data received in January 2023) onto the Lightcast Open Skills taxonomy. To do this, we employ the second step of Nesta's Skills Extractor v1.0.2. The algorithm matches individual skills by name, finding the semantically closest taxonomy skill to each Adzuna skill. Semantic closeness is found by numerically representing all skill entities and taxonomy skills using Huggingface's sentence-transformers/all-MiniLM-L6-v2 pre-trained model and then calculating the similarity between these numerical representations (Nesta, 2023). Processing large amounts of data can sometimes result in shifted mismatches between input skills and output skills. We have manually aligned the matching in these situations.

In addition, the final set of matched skills was further reviewed manually by researchers in the team. In this process, skills were manually filtered based on the adequacy of matching, and some were corrected to the right terms when the algorithm struggled to find the right match. We dropped generic or ambiguous terms, or those that often appear in recruiter disclaimers, and therefore could not be matched to the taxonomy with confidence. These include words such as 'Luxury', 'Answering', 'Discrimination' and 'Dynamics'. We also dropped terms that are better describers of the terms, conditions and benefits of a job, such as 'Insurance', 'Dental Insurance', 'Working abroad' and 'Temporary Placement'. After this process was completed, we were left with an improved dictionary of skills that included more than 4,000 skills. Most individual skills are assigned a category and sub-category following the Lightcast Open Skills taxonomy. When this information was not present, we assigned these skills to the category 'Other'. Extracting skills from wordy job descriptions can be a very complex task. We acknowledge that even with our best efforts to clean this data, it is possible that some skills were originally extracted with error. It is impossible to verify this without access to the proprietary algorithm used by Adzuna. However, given our very large sample size, we do not expect this to affect our results qualitatively.

As described in Section 2, when defining our final sample, we drop job adverts with missing 4-digit SOC codes and locations. It is possible that the absence of this information is not random, so we check whether this is more likely to happen in some occupational categories (Table A1).

Table A1 - Balancing table – Sample means

Occupation (1-digit SOC code level)	Non-missing (1) (%)	Missing (2) (%)	Difference (3) = (1) - (2)
Managers, Directors And Senior Officials	6.35	22.01	-15.66 (0.04)
Professional Occupations	36.32	24.19	12.13 (0.06)
Associate Professional Occupations	18.69	10.97	7.72 (0.04)
Administrative And Secretarial Occupations	6.71	12.07	-5.36 (0.03)
Skilled Trades Occupations	9.15	8.42	0.73 (0.04)
Caring, Leisure And Other Service Occupations	5.40	2.19	3.21 (0.03)
Sales And Customer Service Occupations	6.23	7.20	-0.96 (0.03)
Process, Plant And Machine Operatives	4.51	7.89	-3.38 (0.03)
Elementary Occupations	6.63	5.07	1.57 (0.03)
Sample Size (job postings)	3,043,219	929,153	

Source: Analysis of data provided by Adzuna Intelligence

Note: Pooled initial sample of all unique job postings with SOC1 digit information in September 2016 and 2022, after dropping those without skills listed. Standard errors in brackets.

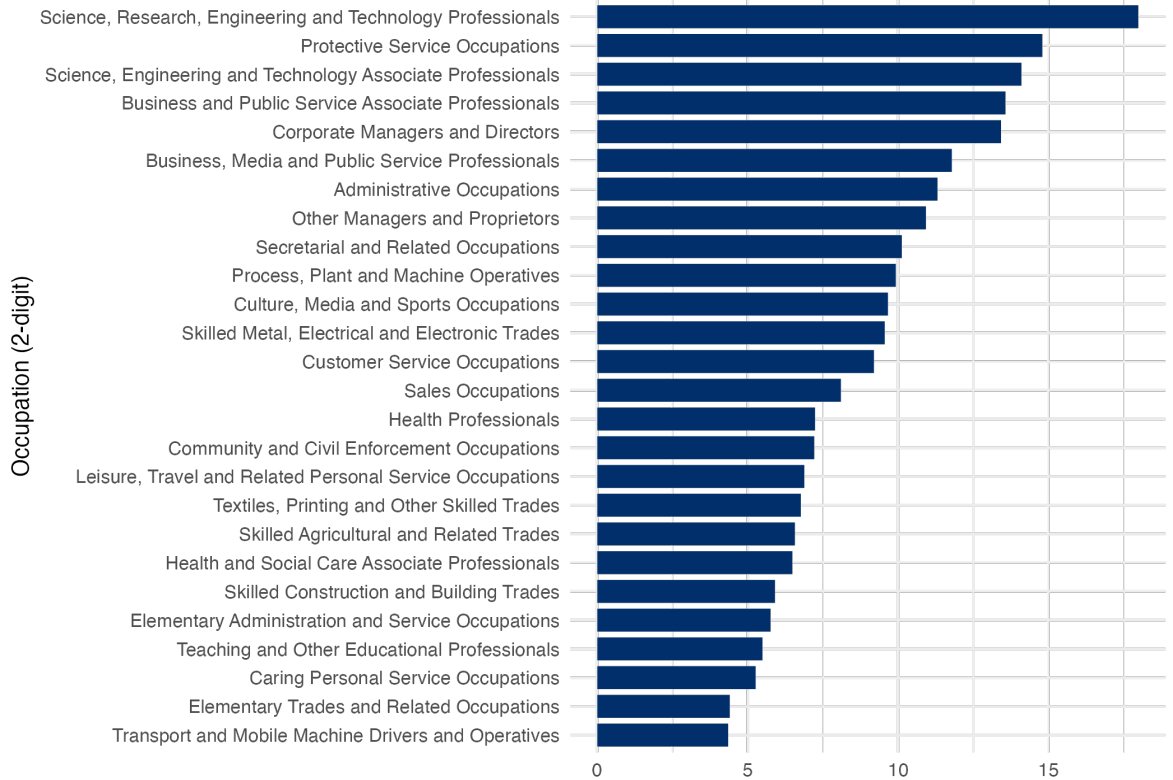
Increasing skills requirements

When examining horizontal changes in the demand for skills, we observe that the number of skills mentioned by job postings is increasing over time across the whole economy. For the pooled sample of all job vacancies, job postings in 2016 mentioned, on average, 9 skills and by 2022 they mentioned 11 skills. This is an indication that employers are providing more detailed job descriptions and are listing in more detail specific skills required for business.

We also observe that the average number of skills mentioned varies considerably across 2-digit SOC code level occupational groups (Figure A1). Jobs in Science, Research and Engineering mention the highest number of skills, on average. At 18, this is three times as many skills than jobs in Construction and Building trades, for example.

We also observe that the increase in the number of skills required happens at a different pace across occupations. As shown in Figure A2, this increase is very concentrated in occupations that tend to be more senior or more technical in Managerial and Professional Occupations, such as Science, Research, Engineering and Technology professionals and Corporate Managers and Directors. On the other hand, adverts for Process, Plant Machine Operatives and Elementary Operations stayed relatively constant (or had a small decrease).

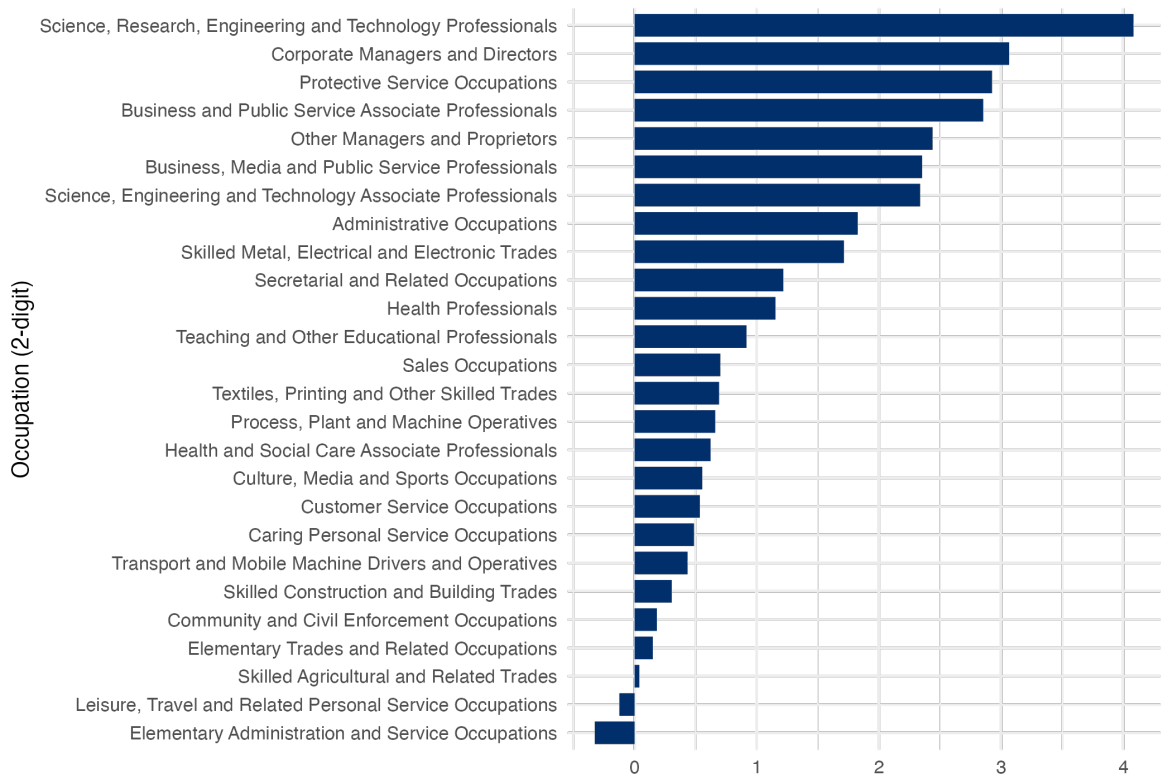
Figure A1: Average number of skills mentioned in job postings in 2022, by occupation (2-digit SOC code level)



Source: Analysis of data provided by [Adzuna Intelligence](#)

Note: In this figure the average skills for 2-digit SOC occupational groups are calculated using the weighted average of skills in 4-digit SOC groups.

Figure A2 – Change in average number of skills 2016-2022, by occupation (2-digit SOC code level)



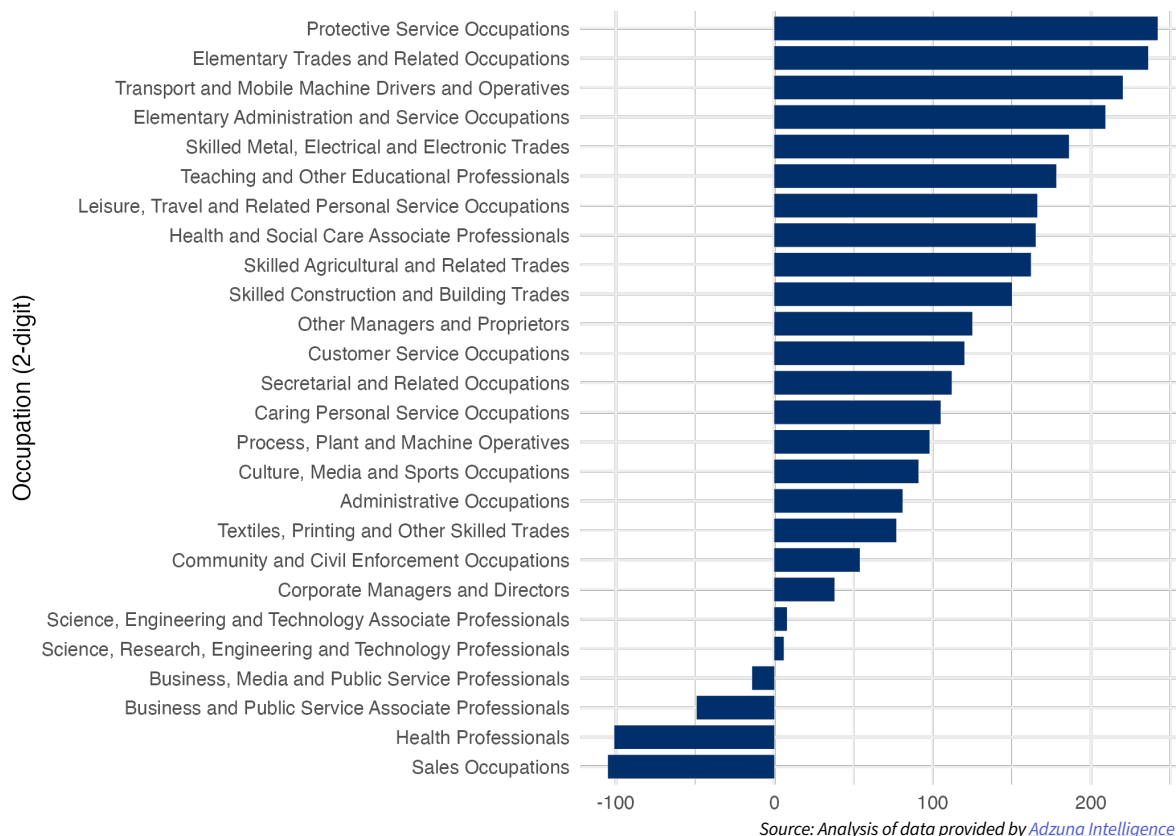
Source: Analysis of data provided by [Adzuna Intelligence](#)

Note: In this figure the average skills for 2-digit SOC occupational groups are calculated using the weighted average of skills in 4-digit SOC groups.

In addition, it is not just that employers are demanding more skills, but the possible set of skills required for similar jobs, that is, jobs in the same occupational code, is changing too. In some occupations (2-digit SOC code level), the set of skills required is very diverse, such as those demanded for the Science, Research Professionals, with 3532 skills mentioned in 2022. Others are much more homogenous, like Teaching professionals, with around 1767 skills and Community and Civil enforcement occupations, with around 211 skills mentioned in 2022.

Figure A3 shows the net change in the possible set of skills mentioned between 2016-2022, revealing that this is increasing for most occupations, but at a different pace. For example, for Corporate Managers and Directors, the set of possible skills mentioned increased by 38 skills. On the other hand, Health Professionals we see a decrease of 101 skills, meaning that descriptions for these jobs have become more similar to each other over this period.

Figure A3 – change in the set of skills mentioned 2016-2022, by occupation (2-digit SOC code level)



Measuring the changes in the number of unique skills (set of skills) required across different job postings for an occupational group is relevant considering that the change in the average number of skills per vacancy does not inform the reader about the diversity of possible skills being requested by employers. Therefore, changes in the set of skills give further information regarding the expansion or contraction of the set of unique skills requested in vacancies of a given occupation even if the average number of skills per posting would have remained unaffected.

Table A2 - Skills categories by major occupational groups (1-digit SOC code level)

Occupation (1-digit SOC code level)	Specialised Skill (%)	Common Skill (%)
Professional Occupations	75.19	24.81
Skilled Trades Occupations	71.46	28.54
Process, Plant And Machine Operatives	70.32	29.68
Associate Professional Occupations	68.89	31.11
Managers, Directors And Senior Officials	66.15	33.85
Administrative And Secretarial Occupations	61.57	38.43
Elementary Occupations	61.17	38.83
Caring, Leisure And Other Service Occupations	59.44	40.56
Sales And Customer Service Occupations	57.88	42.12

Note: This table shows the percentage of skills of each type for the average advert within each 1-digit occupational group



The Pissarides Review
into the Future of
Work and Wellbeing

Automation technologies are transforming work, society and the economy in the UK in ways comparable to the Industrial Revolution. The adoption of these technologies has accelerated through the COVID-19 pandemic, and the impact of automation is unevenly distributed, with a disproportionate impact on demographic groups in lower pay jobs.

The Pissarides Review into the Future of Work and Wellbeing will research the impacts of automation on work and wellbeing, and analyse how these are differently distributed between socio-demographic groups and geographical communities in the UK.

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If you have a professional or research interest in the subject of the impact of automation technologies on work and wellbeing and have insights to share, please contact Abby Gilbert, Director of Praxis at the Institute for the Future of Work at abby@ifow.org

If you are a member of the press and have an enquiry or would like to receive new press releases by email, please email Kester Brewin, Senior Communications Manager at the Institute for the Future of Work at kester@ifow.org