

Sectoral Skills Assessment

Digital Technologies

October 2024



Sectoral Skills Assessments

First launched in 2017, Sectoral Skills Assessments (SSAs) provide a robust and consistent evidence base to support partners in strategic skills investment planning. Skills Development Scotland (SDS) has worked with key partners and stakeholders in the production of SSAs to ensure an inclusive approach to their development, dissemination and utilisation.

SSAs include published data sets. Inevitably, when using published data there is a time lag, but the data contained is the most up-to-date available at the time of writing. SSAs also include forecast data that has been commissioned through Oxford Economics. The Technical Note¹ provides full detail on the caveats that must be applied when using forecast data, but broadly, it should be noted that:

- Forecasts are based on what we know now and include past and present trends projected into the future.
- The more disaggregated they become, especially at smaller geographical units, the less reliable they are likely to be.
- Their value is in identifying likely directions of travel rather than predicting exact figures.
- The forecasts do not account for national or sectoral activities, initiatives or investments that are planned.

Industries and occupations used in the SSAs are defined by standard industrial classifications (SIC)² and standard occupational classifications (SOC).³

This SSA report is for the Digital Technologies sector. The sector encompasses: Reproduction and Repair of Computer Media, Manufacturing of Digital Components, Publishing of Computer Games, Telecommunication Activities, Computer Programming Activities, Data Processing, and Web Portals. Please see Appendix 1 for the SIC definition used in this report.

Key Sectors are central to our Skills Investment Planning approach. Each Key Sector has a tailored Skills Investment Plan (SIP) which outlines trends in skills and qualification supply and employers' perspectives on the skills issues affecting the sector. Regional SIPs have also been developed and are available alongside SIPs on the SDS website.⁴ The SSAs are part of a suite of Labour Market Insight publications by SDS. Other products in the suite include:



Economy, People and Skills report which provides succinct and up-to-date evidence on Scotland's economy, businesses and people. It is updated monthly.



Regional Skills Assessments provide a coherent, consistent evidence base to inform future investment in skills, built up from existing datasets and forecasts for Regional Outcome Agreement areas, Rural Scotland and all City and Growth Deals regions. They are updated annually.



The **Data Matrix** is an interactive tool, offering more detailed data from a variety of sources in a visually engaging format. It is updated frequently.

Alongside the suite of Labour Market Insight publications, SDS also produces a wide range of reports such as statistics on Modern Apprenticeships and the Annual Participation measure for 16-19 year olds. This includes a wide range of data related to equalities. Further information can be found on the [Publications and Statistics](#) section of the SDS website.

We value user feedback on the Sectoral Skills Assessments. If you would like to provide feedback, please do so [here](#). For any further information or queries on the SSAs or any of our other products, please contact: RSA@sds.co.uk



1. SSA Technical Note (2024).

2. Office for National Statistics UK Standard Industrial Classification (SIC) 2007.

3. Office for National Statistics UK Standard Occupational Classification (SOC) 2010.

4. Skills Development Scotland Skills Investment Plans.

The Context for Scotland's Labour Market

Within the last 10 years, the economy has faced significant disruption due to events such as the pandemic, Brexit, the war in Ukraine, and the cost-of-living crisis. In addition, megatrends around demography, technology, and the environment have continued shaping Scotland's economy and labour market, many of which are interdependent. Below is an overview of the drivers expected to have the greatest influence on Scotland's labour market outlook in the near term, based on a comprehensive analysis of structural and cyclical factors.



The Economy

The economic outlook for Scotland has improved, but growth is still expected to be modest in 2024, after annual GDP figures estimated the Scottish economy (like that of the UK) remained broadly flat throughout 2023. While inflation rates have eased from their peak in October 2022, the effects of rising prices and high interest rates continue to impact Scottish households and businesses. Scotland has experienced a tight labour market in recent years, but there have been signs of this loosening in 2024.



Demographic Change

Scotland has an ageing population. In 2022, around 20 per cent of Scotland's population was aged 65 years or over, and around 15 per cent were aged under 15 years old. Population growth is also expected to slow in the next decade, and it is anticipated that the country is likely to rely on in-migration for population growth. These demographic changes in Scotland have important implications for the labour market and economy.



Inclusive Growth and Equality

Scotland continues to experience inequality, which can impact individuals' access to labour market opportunities. Cost-of-living pressures have affected different groups disproportionately, particularly in lower-income households. Geographical inequalities also exist across Scottish regions that can affect individuals' access to opportunities. There have been some advances in improving diversity within the workforce and reducing inequality, but challenges remain.



Technology and Automation

Scotland has a strong technology sector, with specific strengths in digital technology, life sciences and financial technology (fintech). The current makeup of the technology sector suggests AI will likely be the most important technological advance for the foreseeable future. It is estimated that 60 per cent of jobs in developed countries will be affected by AI. This could be disruptive within the labour market, creating challenges and opportunities for job roles and businesses.



Climate Change

The Scottish and UK governments have committed to meeting targets for Net Zero carbon emissions. The transition to Net Zero will directly impact jobs, with potential for job growth in Scotland. Upskilling and reskilling will be vital to equip Scotland's workforce with the skills needed to meet the transition. Scotland is well placed to take a lead in the development of new green technologies building on its significant natural resources and strengths in key sectors.



A fuller report on Scotland's Labour Market Drivers can be found [here](#).

Entrepreneurs and Innovation

Scotland’s Digital Technologies sector has a reputation for innovation. In 2023, Scotland produced more than 1,500 tech start-ups, a 22% increase on the previous year.²

The Scottish Government’s £42m Techscaler investment is designed to capitalise on this entrepreneurial culture, by establishing a network of start-up hubs and by providing access to world class mentorship and development programmes.

The Entrepreneurial Campus and Scotland’s ten-year National Innovation Strategy further indicates the importance of tech-enabled growth for the Scottish economy.

Fostering enterprise skills in young people, through initiatives such as volunteer supported Young Enterprise Scotland, will help sustain this culture and maximise future opportunities for the sector.

Scotland’s Tech Sector Opportunity

Within the Digital Technologies sector, with a cluster of over 220 companies,³ fintech is ranked as the strongest Scottish tech sub-sector, with health tech following close behind. Climate tech is also emerging as a strength with more than 600 companies⁴ registered in Scotland that use technology to tackle climate change.

Fueled by these existing clusters, but also emerging sectors like geospatial tech, the Scottish tech sector is predicted to grow even more rapidly over the next five years.⁵

Artificial intelligence will also drive growth and Scotland has recognised strengths in this field. For example, Edinburgh has been named as the most AI ready city in the UK outside London, with significant expertise in AI and data.⁶ The University of Edinburgh is considered particularly productive having trained many of Europe’s AI experts.⁷

Tech sector growth will be further supported by Scottish Government efforts to enable Scotland’s deep tech (e.g. blockchain, artificial intelligence and quantum) sectors. For example, the recent Programme for Government identified collaborations between Scottish Enterprise, the National Manufacturing Institute for Scotland, and the National Robotarium which will support and advance this through public and private collaborations.

Through maximising opportunities in the sector, success could mean Scotland benefiting from economic gains such as the £4 billion GDP which blockchain technology could contribute by 2030, and the cross sector economic and societal benefits from climate tech solutions.⁸

In Demand Occupations and Skills

The increased digitalisation across all sectors, combined with the prevalence for remote and hybrid working means that attracting top talent remains competitive for Scottish employers, and despite some evidence of slowing in the market, tech jobs vacancies are still above pre-pandemic levels.⁹ Software roles, data engineers and cyber security managers appear in the ten most in demand UK tech roles.¹⁰

In addition, 61% of Scottish employers require software skills but this sits behind an increasing demand for data and AI skills, required by 63% of employers, and demand for these technical skills is also outstripped by commercial awareness, as sales and marketing skills dominated employer needs at 80%.⁹

It is important to note that the forecasts used in this Sectoral Skills Assessment are policy and investment neutral.

This means the figures present a baseline outlook that takes into account historical trends and external economic conditions, but the figures do not reflect investment or policy that is unconfirmed or at planning/development stage. Therefore, the forecasts should be used in conjunction with other sources, and readers are encouraged to overlay these with their own local and sectoral knowledge.

1. Insight from the sector gathered via Skills Development Scotland (2024).
2. RSM (2024). Tech company incorporations by year.
3. FinTech Scotland (2024).

4. The University of Edinburgh (2023). Report highlights Scotland’s climate tech strengths.
5. UKTN (2024). Tech report. Scotland.
6. Future Scot (2023). Edinburgh named most ‘AI

ready’ city.
7. SEQUOIA (2023). Atlas.
8. Scottish Enterprise (2023).
9. ScotlandIS (2024). Technology Industry Survey.

10. Hayes (2024). Top 10 most in-demand tech jobs for 2024.

Recruitment Strategies

Talent attraction and retention, however, can be challenging for Scottish employers and could inhibit opportunities for growth – particularly for start-up and scale-ups, who are competing with the attraction of tech hubs in London and Manchester.

Scottish technology employers predominantly recruit from Scotland (62%), with a small but important number of employees being attracted from Europe (4%) and internationally (9%). Scotland's newly launched [Migration Service](#) has been developed to help employers recruit overseas talent, which could be an important solution for hard to fill technology skills shortages.²

Technology employers are also using alternative approaches to fill both temporary and permanent roles; word of mouth, technology forums and meetups, and hidden tech recruitment pools (where talent looks for more flexibility in their working patterns) are identified as sources of new recruits.

There is a recognised talent pool in Scotland for digital tech skills. For example, Scotland appears in the TechUK top ten for digital skills³ reflecting the numbers undertaking technology related studies at college, university and with private and online training providers. The number of technology employers expecting to recruit graduates in 2024 has declined from 34% to 29% from 2023, possibly reflecting a

general overall slowdown in tech vacancies or the preference for more experienced hires.²

That said, there is evidence of the increasing importance of apprenticeships as part of recruitment strategies, as demand for Graduate Apprenticeships and Modern Apprenticeships are up by 3% and 6% from 2023. Almost half of employers (46%) were also expecting to recruit careers changers in 2024.²

Building an Inclusive Digital Skills Pipeline

Achieving and sustaining this opportunity for growth requires intervention at all stages of the pipeline which is also essential to help address inequalities.

Computing science uptake at school remains an issue for employers who are concerned about the relatively low numbers of young people participating, and the decline in computing science teachers. There has been some progress with Higher computing science entries up 5% in 2024 to 3,745, of which 785 were female, representing an increase of almost 15% on the previous year.⁴

Despite improvements at school and increases in the numbers of females in tech jobs,⁵ only 20% of Scotland's entrepreneurs are women and 2% of investment capital flows to female owned businesses.⁶ The implementation of the Stewart Review into female entrepreneurship, which includes a [Pathways Fund](#) and specialist enterprise coaches,

could help address the gender disparity and some of the sector's workforce challenges. Digital exclusion also remains a significant challenge in Scotland which may have consequences for growth. For example, 15% of Scotland's adult population were found to lack the most basic digital skills to be able to fully function in society and to access important volunteering, training, and employment opportunities.⁷

Supporting Sector Development

There are a number of, often volunteer led initiatives, which are aiming to overcome these challenges and support the building and supply of technology skills and capability in Scotland. For example:

- The [Scottish Teachers Advancing Computing Science \(STACS\)](#) is a teacher-led organisation, collaborating with the Computing Science teacher community, to collectively advance Computing Science. They support schools, for example, through connecting pupils with inspirational industry speakers;
- The volunteer led [Scottish Tech Army](#) also works in partnership with the technology ecosystem to deliver scalable, impactful solutions; and
- [STEM Ambassadors](#) are a network of volunteers working in or studying STEM subjects who work with young people to bring STEM subjects alive through real-life experience.

1. Insight from the sector gathered via Skills Development Scotland (2024).
2. ScotlandIS (2024). [Technology Industry Survey](#).

3. techUK (2023). [Digital Index 2023](#).
4. Future Scot (2024). [Computing science entries](#).
5. SDS (2023). [Digital Economy Skills Action Plan](#).

6. Scottish Government (2023). [Pathways: A New Approach for Women in Entrepreneurship](#).
7. Audit Scotland (2024). [Tackling digital exclusion](#).

Gross Value Added (GVA, £m) (2014-2034)²



In 2024, GVA in the Digital Technologies sector was estimated to be £6,867m, generating 4.7% of Scotland's total economic output. Between 2014 and 2024, GVA in the sector was estimated to have increased by 7.1% on average each year, compared to growth of 0.5% across Scotland over the same period.

In 2023, GVA in the Digital Technologies sector was estimated to have a moderate increase of 3.5%. However, due to the challenging economic context, GVA growth in the sector was expected to slow to 0.5% in 2024.

Looking ahead, GVA in the Digital Technologies sector is forecast to grow on average 2.6% each year between 2024 and 2034, which is above Scotland's average. In 2034, the Digital Technologies sector is forecast to account for 5.3% of Scotland's total economic output.



Digital Technologies forecast GVA in 2027: **£7,421m**

↑ up 8.1% from 2024

Scotland forecast GVA in 2027: **£151,968m**

↑ up 4.2% from 2024

Digital Technologies forecast GVA in 2034: **£8,877m**

↑ up 19.6% from 2027


Scotland forecast GVA in 2034: **£166,273m**

↑ up 9.4% from 2027

Productivity (GVA per job)³

In this report, we have used Oxford Economics' measure of productivity, which is calculated by dividing total sectoral GVA by total sectoral employment (measured by jobs). Please note, there are different ways of calculating productivity, and caution is needed when interpreting productivity data presented in this report. It must be considered in the context of other data and insight.

In 2024, productivity in the **Digital Technologies** sector was estimated to be **£75,400**. In comparison, the Scottish average was £52,000.




Digital Technologies forecast productivity in 2027: **£78,500**

↑ up 4.0% from 2024

Scotland forecast productivity in 2027: **£53,000**

↑ up 1.9% from 2024



Digital Technologies forecast productivity in 2034: **£92,300**

↑ up 17.6% from 2027

Scotland forecast productivity in 2034: **£57,100**

↑ up 7.9% from 2027

1. SDS (2024). Oxford Economics Forecasts.

2. GVA is the measure of the value of goods and services produced within the economy and is an indicator of the sector's health. GVA in constant 2019 prices.

3. Productivity is the measure of goods and services produced per unit of labour input. The Oxford Economics forecasts of productivity shown here

have been calculated by dividing total sector GVA by total sector employment (measured by jobs).

Current Demand¹



Workforce size 2024: **87,700** people

The sector's workforce was estimated to have **increased** by **33.2%** or **21,900** people between 2014 and 2024.

This compares to a Scotland wide increase of **3.8%** or **97,300** people between 2014 and 2024.

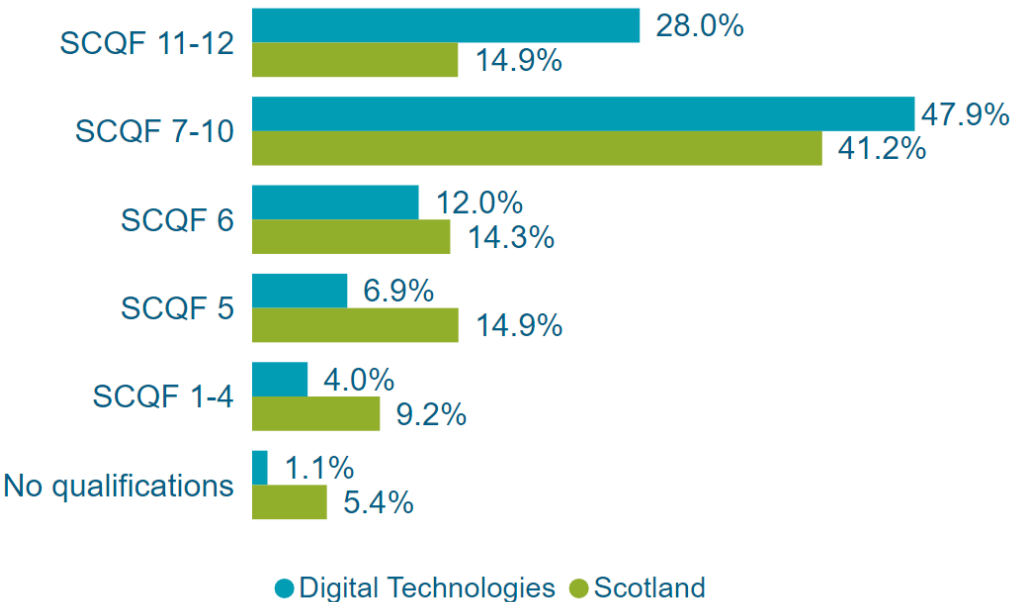
Employment by Region (people), 2024

The greatest number of people employed in **Digital Technologies** were estimated to be in:

| Glasgow College Region * | Edinburgh, East and Midlothian | Fife | West Lothian |
|--------------------------|--------------------------------|-------|--------------|
| 23,600 | 20,900 | 7,000 | 6,800 |

Workforce Qualifications, 2024

It was estimated that workers in the **Digital Technologies sector** had higher qualifications than the Scottish average, with 76% qualified to SCQF Level 7 and above in 2024.²



Top 10 Employing Occupations (people), 2024



1. SDS (2024). Oxford Economics Forecasts.
2. See [SCQF Framework](#) for further information on SCQF qualification levels.

*Glasgow College Region covers East Dunbartonshire, East Renfrewshire and Glasgow City local authorities.

Current Demand¹

The proportion of Local Authorities' workforce employed in Digital Technologies, 2024²

In 2024, the **Digital Technologies** sector was estimated to account for **3.3%** of Scottish employment.

Scottish local authorities have sectoral strengths that make them unique. This means that the **Digital Technologies** sector may be more important to some local economies, as a higher proportion of the local workforce is employed in the sector.

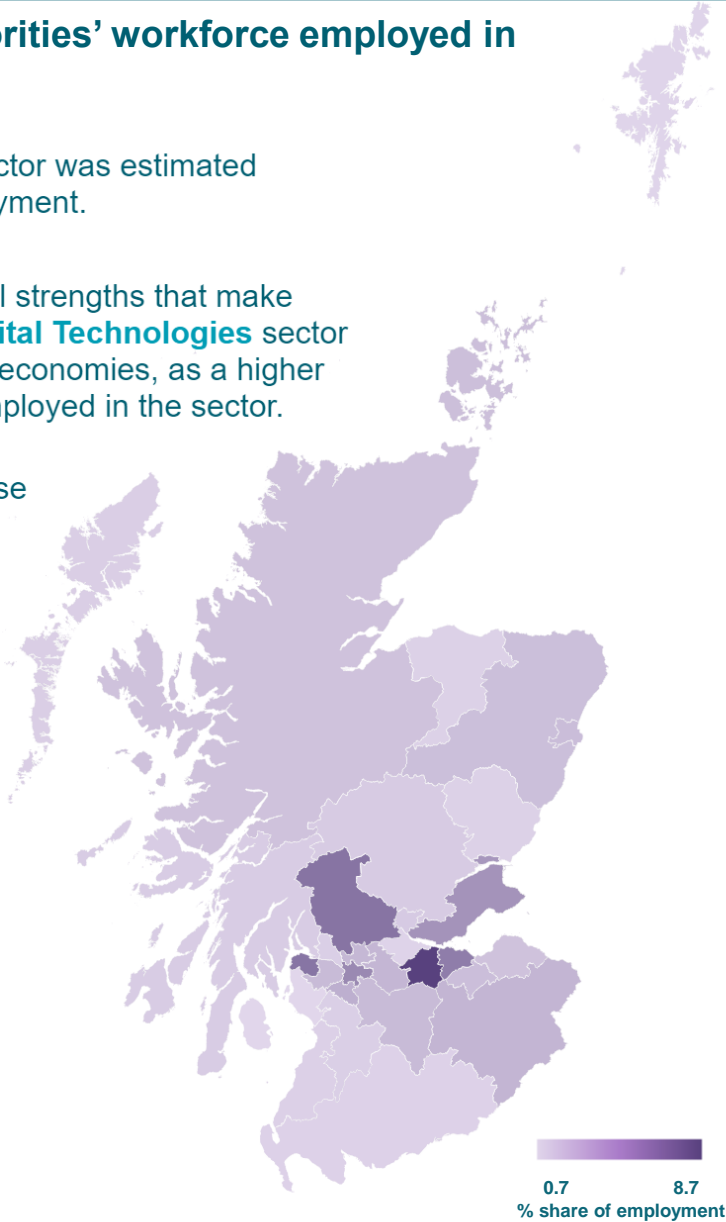
The sector was most prominent in these local authorities:

West Lothian
8.7%

Stirling
6.0%

Inverclyde
5.9%

City of Edinburgh
5.5%



Real Living Wage and Gender Pay Gap³

Individuals earning Real Living Wage or more:

In April 2023, the real living wage rate for employees who did not work in London was £10.90.



Manufacturing

2022: **90.6%** 2023: **90.6%**

Information & Communication

No data available

Other Service Activities

2022: **75.1%** 2023: **79.7%**

All sectors

2022: **90.6%** 2023: **89.9%**

Gender Pay Gap for median full-time hourly earnings:



Manufacturing

2022: **16.6%** 2023: **13.9%**

Information & Communication

2022: **12.2%** 2023: **14.9%**

Other Service Activities

2022: **21.3%** 2023: **-8.4%**

Scotland

2022: **3.0%** 2023: **1.7%**

Due to data availability, a 'best fit SIC code approach' has been used, so sectors definitions here may not fully match key sector definitions.

Modern Apprenticeships⁴



MAs starts for IT & Other Services*:

Q4 2022/23: **3,258** Q4 2023/24: **2,621** Q1 2024/25: **373**



MAs in training for IT & Other Services*:

Q4 2022/23: **4,077** Q4 2023/24: **3,842** Q1 2024/25: **3,307**

* Based on [SDS Occupational Groupings](#).

For data on FAs and GAs please see the Publications section of our [website](#). For data on colleges and universities please see [Scottish Funding Council](#) and [Higher Education Statistics Agency](#).

1. SDS (2024). Oxford Economics Forecasts.

2. The proportion of the workforce in the Local Authority employed in the sector is calculated by dividing the sectoral employment in the area by total employment in the area.

3. Scottish Government (2023). Annual Survey of Hours and Earnings: 2023. Due to data availability, a 'best fit [SIC code](#) approach' has been used, so the sectoral definitions and totals in this section may vary from those we have used elsewhere.

4. SDS (2024). Modern Apprenticeship Statistics, Quarter 1, 2024/25.



Spotlight on... Data Analysts³

Between July 2023 and June 2024, there were **570 job postings**. Postings were high at the end of 2021 and into 2022, declining thereafter. The number of job postings decreased by 36% between July 2022 and June 2023, and July 2023 and June 2024 (21% decline across all occupations comparatively), falling below pre-pandemic levels.

Top Locations between July 2023 and June 2024 were:



The largest growth in job postings between July 2022 - June 2023 and July 2023 - June 2024 was in Perth and Kinross (+11) and West Lothian (+9).

Specialised skills and knowledge requested (July 2023 - June 2024) included:



Median real-time advertised salary July 2023 – July 2024: **£47,500**



Spotlight on... Programmers and Software Developers⁴

Between July 2023 and June 2024, there were **11,360 job postings**. Job postings were high during 2022, and as a result, the number of job postings has decreased by 48.4% compared to the period between July 2022 and June 2023 (21% decline across all occupations comparatively), falling below pre-pandemic levels.

Top Locations between July 2023 and June 2024 were:



The largest growth in job postings between July 2022 - June 2023 and July 2023 - June 2024 was in Angus (+37).

Specialised skills and knowledge requested (July 2023 - June 2024) included:



Median real-time advertised salary July 2023 – July 2024: **£49,100**

1. Lightcast 2024. Online job postings data provides a useful barometer for the health of the jobs market. It is important to note that the data does not capture all activity, so it should be considered as an estimate of activity.

2. Job postings are rounded to the nearest 10.

3. Data is based on job titles for the whole of Scotland. Median salary based on 36% of job postings.

4. Data is based on SOC 2134 for the whole of Scotland. Median salary based on 33% of job postings.

Future Demand: Mid-term (2024-2027)¹

In the mid-term (2024-2027), **the number of people in employment is forecast to grow by 3.7% (3,200 people)** in the **Digital Technologies** sector. This is a larger percentage growth than is forecast overall across Scotland where employment is predicted to rise by 1.9% (49,800 people).

In 2027, the top employing regions in the sector are forecast to be **Glasgow College Region** and **Edinburgh, East and Midlothian**, the same as in 2024. Similar to 2024, **the largest proportion of the workforce** is forecast to be educated to **SCQF 7-10**. The top employing occupation is forecast to be **Science and Technology Professionals**.

Forecasts for the mid-term (2024-2027) suggest there could be demand for **4,500 people in the sector**, as a result of the need to replace workers leaving the labour market and opportunities created through expansion demand. Whilst positive, caution is needed as a wide range of factors may impact the future labour market.

Workforce (people), 2027



Workforce size 2027: **91,000** people



The sector's workforce is expected to **grow** by **3.7%** or **3,200** people between 2024 and 2027



Compared to a Scotland wide increase of **1.9%** or **49,800** people

Total Requirement*



=



+



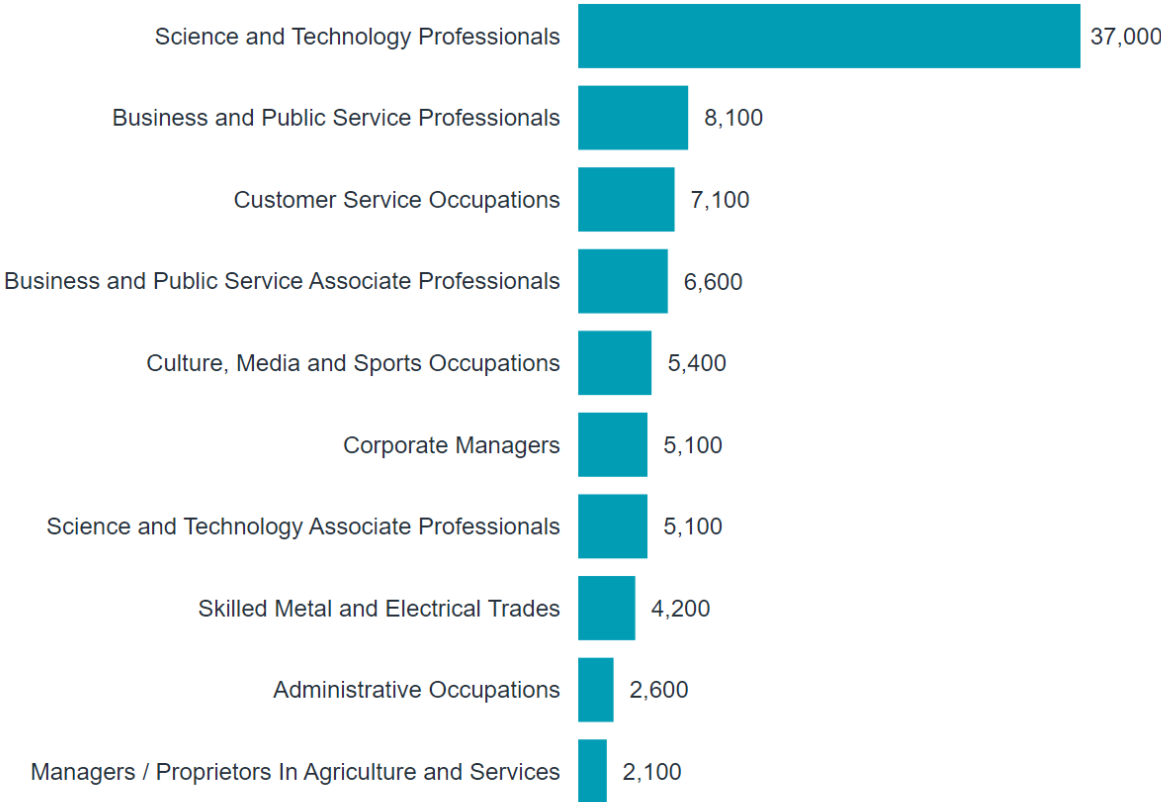
Total requirement:
4,500 people

Replacement demand:
1,300 people

Expansion demand:
3,200 people

Digital Technologies is forecast to account for **1.2%** of Scotland's total requirement for people in the mid-term (2024-2027)

Top 10 Employing Occupations (people), 2027



1. SDS (2024). Oxford Economics Forecasts.

* Total requirement for people is made up of expansion and replacement demand. The expansion demand is the number of people required as a result of economic growth or contraction.

The replacement demand is the number of people required to replace workers leaving the labour market (i.e. those who retire, move away or change jobs). Please note, figures are rounded to the nearest 100 and as a result totals may not equal the sum of the constituent parts.

Future Demand: Long-term (2027-2034)¹

Employment growth in the **Digital Technologies** sector **is forecast to continue, with an increase of 1.8% (1,600 people)** in the long-term (2027-2034). This is a larger percentage growth than is forecast overall across Scotland where employment is predicted to rise by 1.2% (32,000 people).

In 2034, **Glasgow College Region** and **Edinburgh, East and Midlothian** are forecast to remain the top-employing regions in the sector. The largest proportion of the workforce employed in the sector is **forecast to be educated to SCQF 7-10**, and **Science and Technology Professionals** is forecast to remain the most in-demand occupation within the sector.

Forecasts for the long-term (2027-2034) estimate that **5,100 people** could be required in the sector. This will be driven by **the need to replace workers** leaving the labour market **and the creation of opportunities** through expansion demand.

Workforce (people), 2034



Workforce size 2034: **92,600** people



The sector's workforce is expected to **grow** by **1.8%** or **1,600** people between 2027 and 2034



Compared to a Scotland wide increase of **1.2%** or **32,000** people

Total Requirement*



=



+



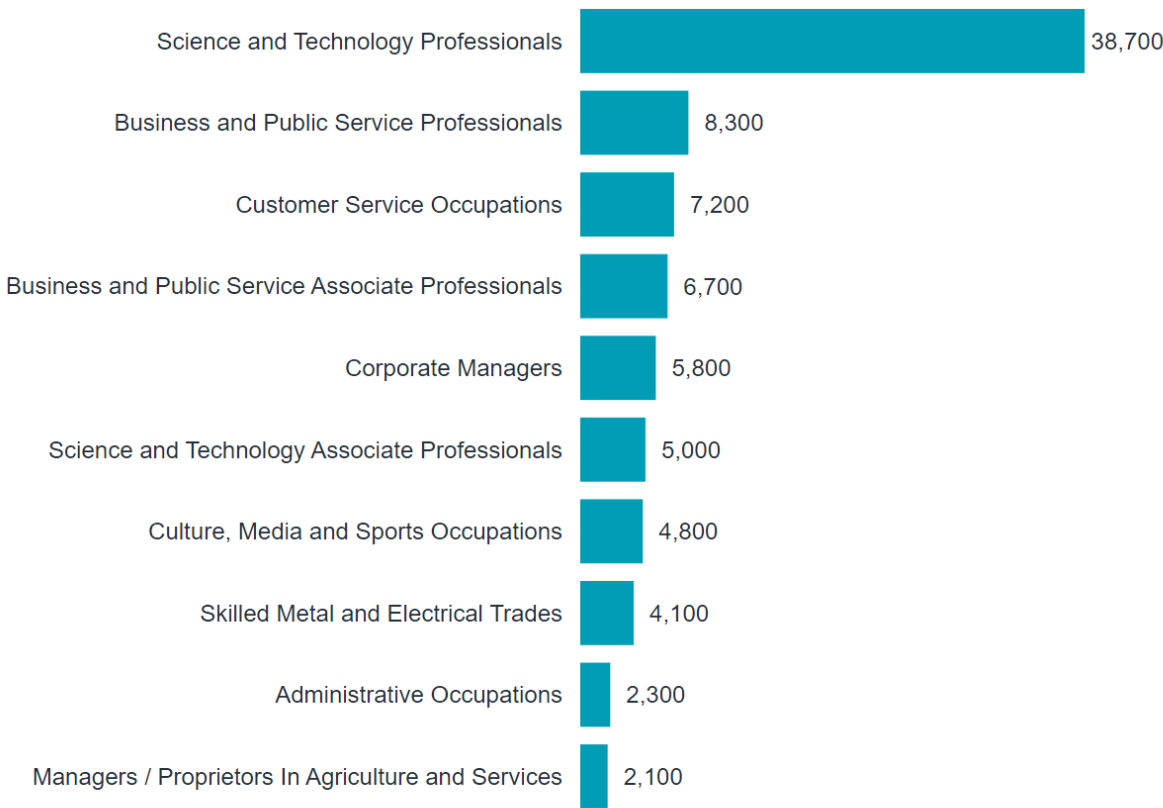
Total requirement:
5,100 people

Replacement demand:
3,500 people

Expansion demand:
1,600 people

Digital Technologies is forecast to account for **0.6%** of Scotland's total requirement for people in the long-term (2027-2034)

Top 10 Employing Occupations (people), 2034



1. SDS (2024). Oxford Economics Forecasts.

* Total requirement for people is made up of expansion and replacement demand.
The expansion demand is the number of people required as a result of economic growth or contraction.

The replacement demand is the number of people required to replace workers leaving the labour market (i.e. those who retire, move away or change jobs). Please note, figures are rounded to the nearest 100 and as a result totals may not equal the sum of the constituent parts.

Appendix 1: Digital Technology Sector Definition (SIC 2007)

| SIC | Name |
|---------|--|
| 18.20/3 | Reproduction of computer media |
| 26.11 | Manufacture of electronic components |
| 26.12 | Manufacture of loaded electronic boards |
| 26.20 | Manufacture of computers and peripheral equipment |
| 26.30 | Manufacture of communication equipment |
| 26.40 | Manufacture of consumer electronics |
| 26.8 | Manufacture of magnetic and optical media |
| 27.31 | Manufacture of fibre optic cables |
| 58.21 | Publishing of computer games |
| 58.29 | Other software publishing |
| 61.1 | Wired telecommunications activities |
| 61.2 | Wireless telecommunications activities |
| 61.3 | Satellite telecommunications activities |
| 61.9 | Other telecommunications activities |
| 62.01 | Computer programming activities |
| 62.02 | Computer consultancy activities |
| 62.03 | Computer facilities management activities |
| 62.09 | Other information technology and computer service activities |
| 63.11 | Data processing, hosting and related activities |
| 63.12 | Web portals |
| 63.99 | Other information service activities n.e.c. |
| 95.11 | Repair of computers and peripheral equipment |
| 95.12 | Repair of communication equipment |

For further information or queries on the SSAs or any of our other products, please contact: [**RSA@sds.co.uk**](mailto:RSA@sds.co.uk)