

ScotlandIS
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Scottish

Technology

2019

Industry

Survey

Supported by



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Each year the Scottish Technology Industry Survey provides a measure of the industry's health and performance during the last year and expected development during the current year.

In the constantly changing times we are living in, the insights our annual survey reports provide are valued by business leaders, investors and public sector stakeholders. Developments in the digital technologies sector are often not sufficiently captured by official statistics. We see this survey as filling part of this gap but also welcome efforts to improve official statistics in Scotland and the UK.

ScotlandIS would like to thank everyone who took part in this year's Scottish Technology Industry Survey for their invaluable input. Special thanks go to The Data Lab for sponsoring this year's survey and providing input and commentary on data related issues.

The survey results help ScotlandIS to represent the digital technologies industry better and provide support to members and the wider sector to grow their businesses and thus contribute to Scotland's economic growth. Please read more about our activities in response to the issues raised by survey participants at the end of this report.

Polly Purvis,
Chief Executive, ScotlandIS

Top Trends



Good performance in 2018 but concerns for 2019

The majority of our survey respondents (72%) are optimistic about the current year although this is slightly down on 2018 levels (80%). The top three challenges for 2019 are staff recruitment and retention, mentioned by 52% of respondents, followed by the current political situation (41%) and sales and winning new business (30%). This and other responses show that Brexit uncertainty and its potential impacts are an increasing concern for our industry. Nevertheless, 83% of respondents expect to increase sales over the next twelve months (slightly down on last year's figure of 86%).

2018 proved to be a good year for the tech sector with the share of companies reporting increased sales and profit margins up from 68% to 75% for sales and from 47% to 51% for profit margins.

International sales levels decreased from 64% in 2017 to 53% in 2018. Additionally, respondents reporting no plans to export have increased from 19% to 29%, potentially indicating caution regarding international growth. The top three export markets remain the same as in previous years, the Rest of the UK (RUK), Europe, and North America. RUK is once again the main export market, regaining top place from Europe which had led the export market rankings in 2017.



83%   **Expect sales to INCREASE**



Demand for talent remains strong

The demand for new staff has remained stable, with 81% of respondents forecasting they will increase employee numbers in 2019, slightly up from 80% in 2018, and 78% in 2017.

Demand for university graduates remains strong with 70% of all businesses reporting they are definitely or quite likely to recruit university graduates in 2019. This demand has remained largely stable around 70% over the last few years. For the first time, we asked companies about plans to recruit college graduates; 43% of respondents are likely to recruit from colleges whilst 45% are unlikely to do so.

32% of respondents report that they are definitely or quite likely to recruit Modern Apprentices in 2019. This is a decrease from last year (45%). However, this might be influenced by this year's inclusion of Graduate and Foundation Apprenticeships in this question. In fact, respondents report they are more likely to take on a Graduate Apprentice (38%) than a Modern Apprentice (32%), while Foundation Apprenticeships are the least popular as companies tend to be less aware of these.

Skills requirement

The most in demand skills sets this year are sales & marketing and software & web development. 86% of respondents indicated some or a high requirement in sales & marketing, while 72% require software & web development skills.

Two new categories were introduced - data analytics and artificial intelligence/machine learning (AI/ML) - due to their growing importance in the technology industry. Demand for both of these skills sets is similar with 55% of respondents requiring data analytics skills and 59% requiring AI/ML skills. Large businesses have the highest demand for these two skills sets.



.NET, JavaScript and Python are the most in demand programming languages this year. Looking beyond software development, demand for cloud computing, data analytics skills and cyber security skills is the highest.

Industry Overview



Scotland's digital technologies sector

In 2018, approximately 9,400 digital technologies businesses were registered in Scotland (about 40% with more than 1 employee) which makes up 5.4% of the business base in Scotland and 5% of the UK's digital technologies business base.¹ These figures have changed little from 2017, with the overall number of digital technologies businesses remaining pretty static. This compares with 1.3% growth for tech businesses across the whole of the UK.

According to data from the Office of National Statistics (ONS), 'computer programming and consultancy' is the largest sub-sector, making up 85% of all digital technologies businesses (employing 56% of the tech workforce) followed by 'telecommunications' with 4% of the company base (29% of the workforce).

In 2017,² the digital technologies sector contributed £5.9bn to the Scottish economy, more than 4% of total GVA. The sector's GVA is forecast to grow by 38%, over the period to 2024, making it the fastest growing sector in Scotland; more than twice the rate of 17.5% for the economy overall.³ However, the GVA growth between 2016 and 2017 has been slow with only 1% for Scotland's digital technologies sector and 3% for all industries.

10% (or £3.3bn) of Scotland's international sales were generated by digital technologies companies in 2017.⁴ This is a growth of 39% between 2016 and 2017. 42% of these exports go to EU countries and the value of exports to the EU has grown by 50% between 2016 and 2017. Sales by digital technologies businesses in Scotland to the rest of the UK have a value of £3bn. However, actual export figures for the digital technologies sector will be higher since the majority of sales are in the form of services, which are not captured comprehensively by official trade statistics.⁵

¹ Please see the chapter on methodology at the end of the report for details on the definition of the digital technologies sector and sources of the figures in this industry overview.

² Latest available data.

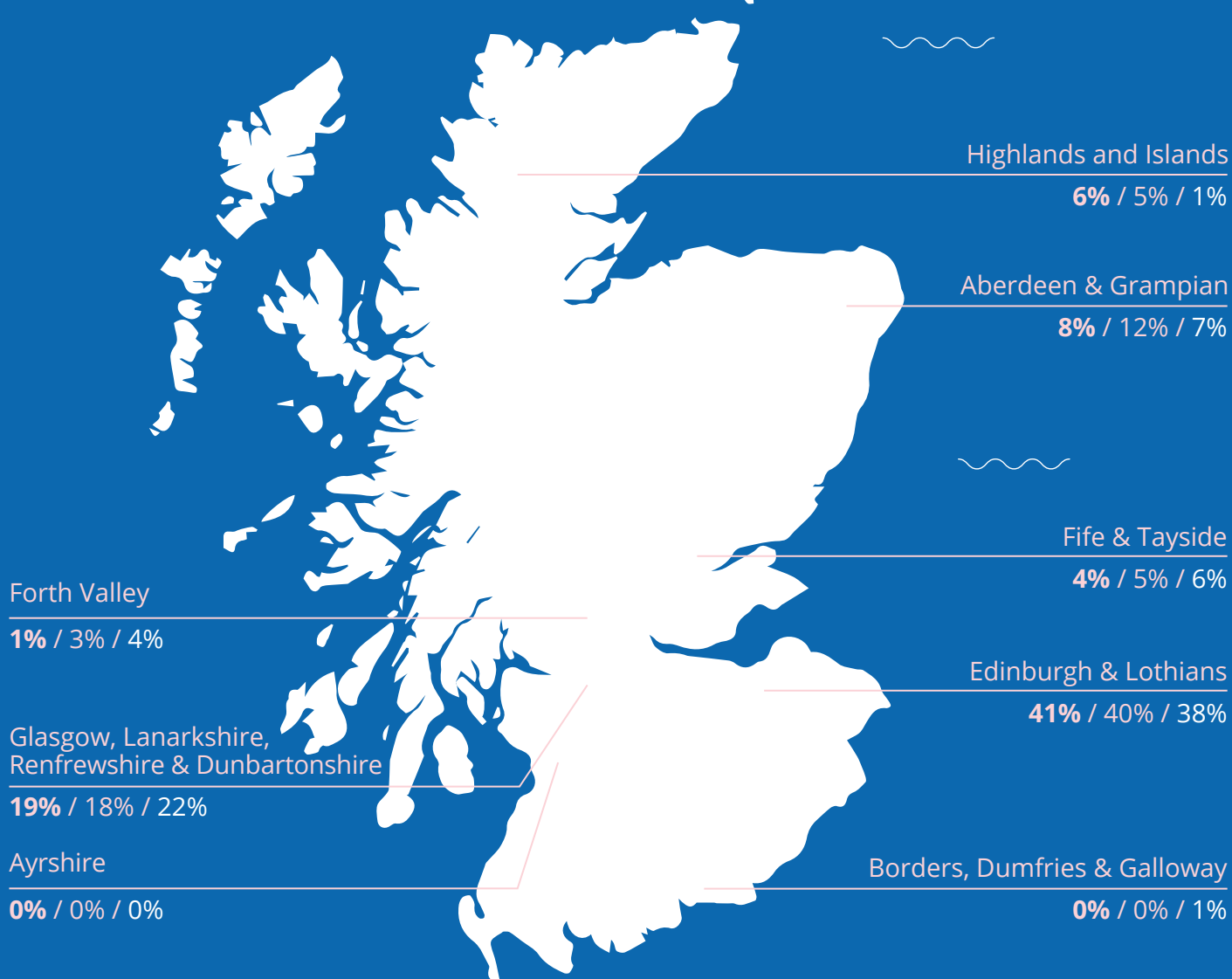
³ Digital Scotland, Scotland's Digital Technologies: Summary Report, June 2017, available at: <https://www.skillsdevelopmentscotland.co.uk/media/43306/scotlands-digital-technologies-summary-report.pdf>, p.8.

⁴ Latest available data.

⁵ <https://publications.parliament.uk/pa/ld201617/ldselect/ldcom/135/13508.htm#footnote-215>, p.3.

Headquarters location

The biggest cluster of respondents is based in Edinburgh & Lothians (41%), followed by the Greater Glasgow and Clyde area (19%), and the UK outwith Scotland (10%). The number of respondents in the Aberdeen & Grampian region has decreased from 12% in 2018 to 8% this year.



2019 / 2018 / 2017

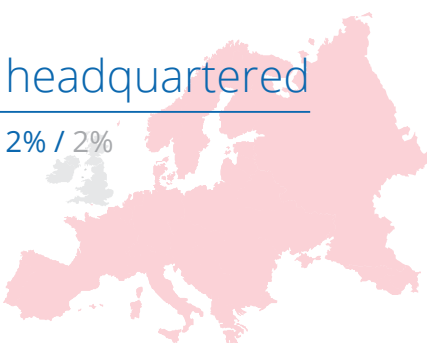
2019 / 2018 / 2017

UK outwith Scotland

10% / 11% / 10%

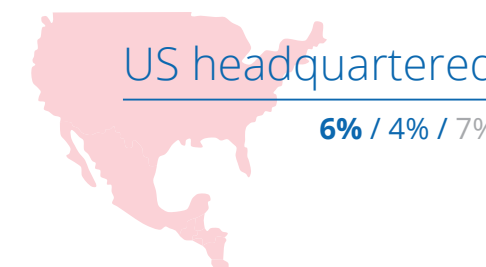
EU headquartered

1% / 2% / 2%



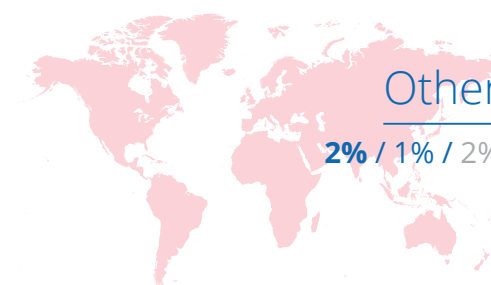
US headquartered

6% / 4% / 7%



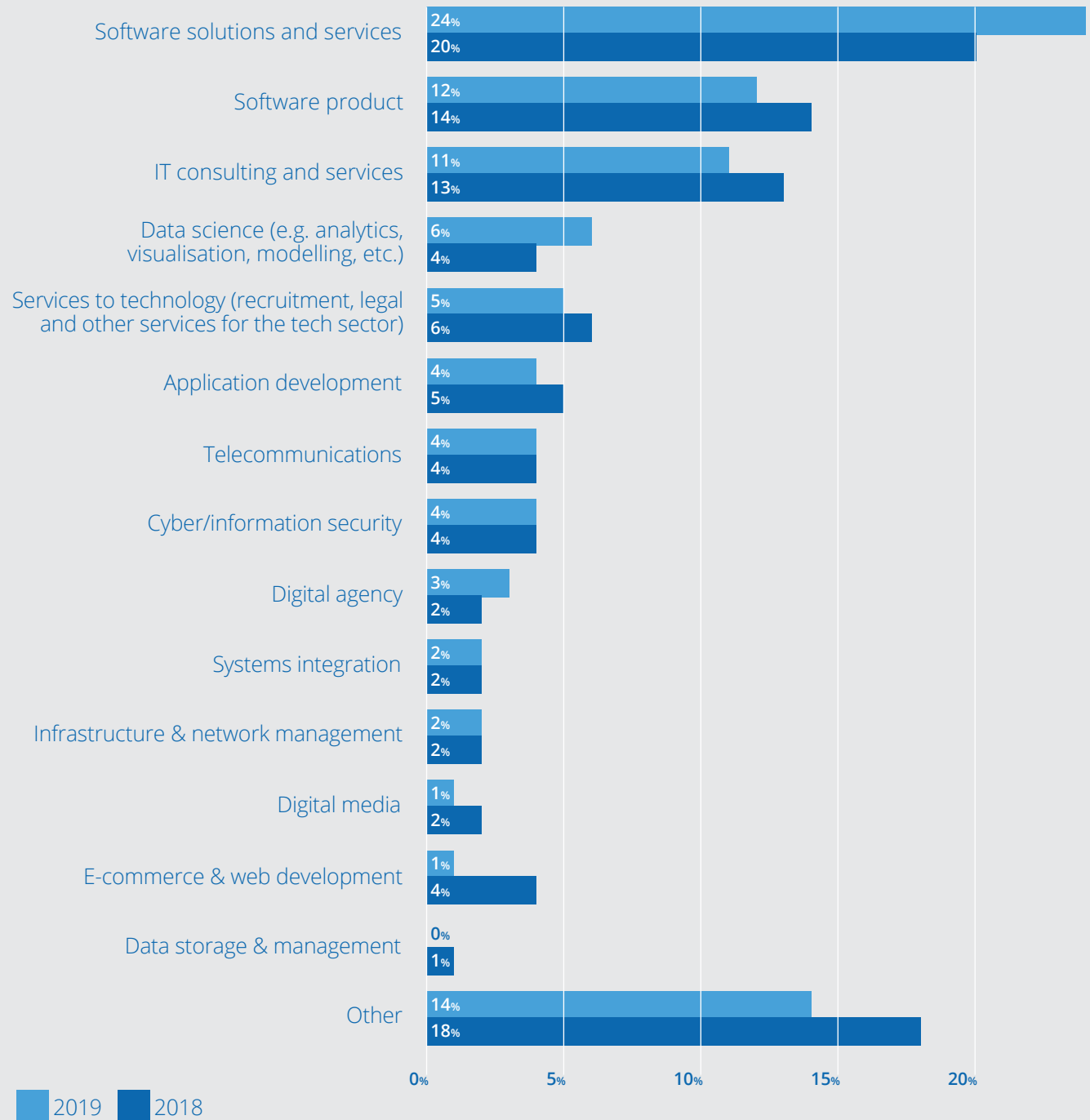
Other

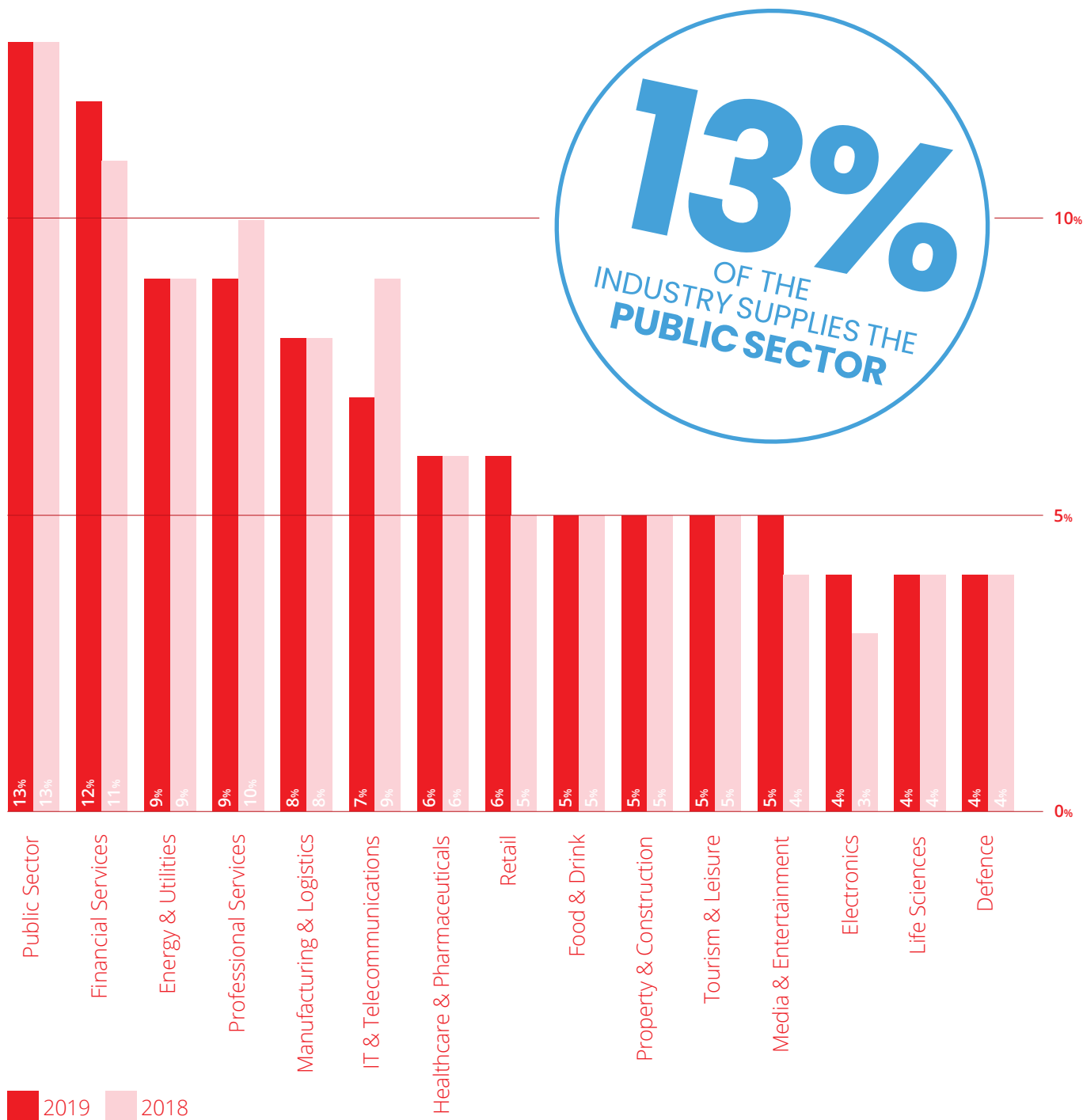
2% / 1% / 2%



Main activity of business

Software solutions and services (24%) and software products (12%) continue to be the most significant activities respondents are engaged in.



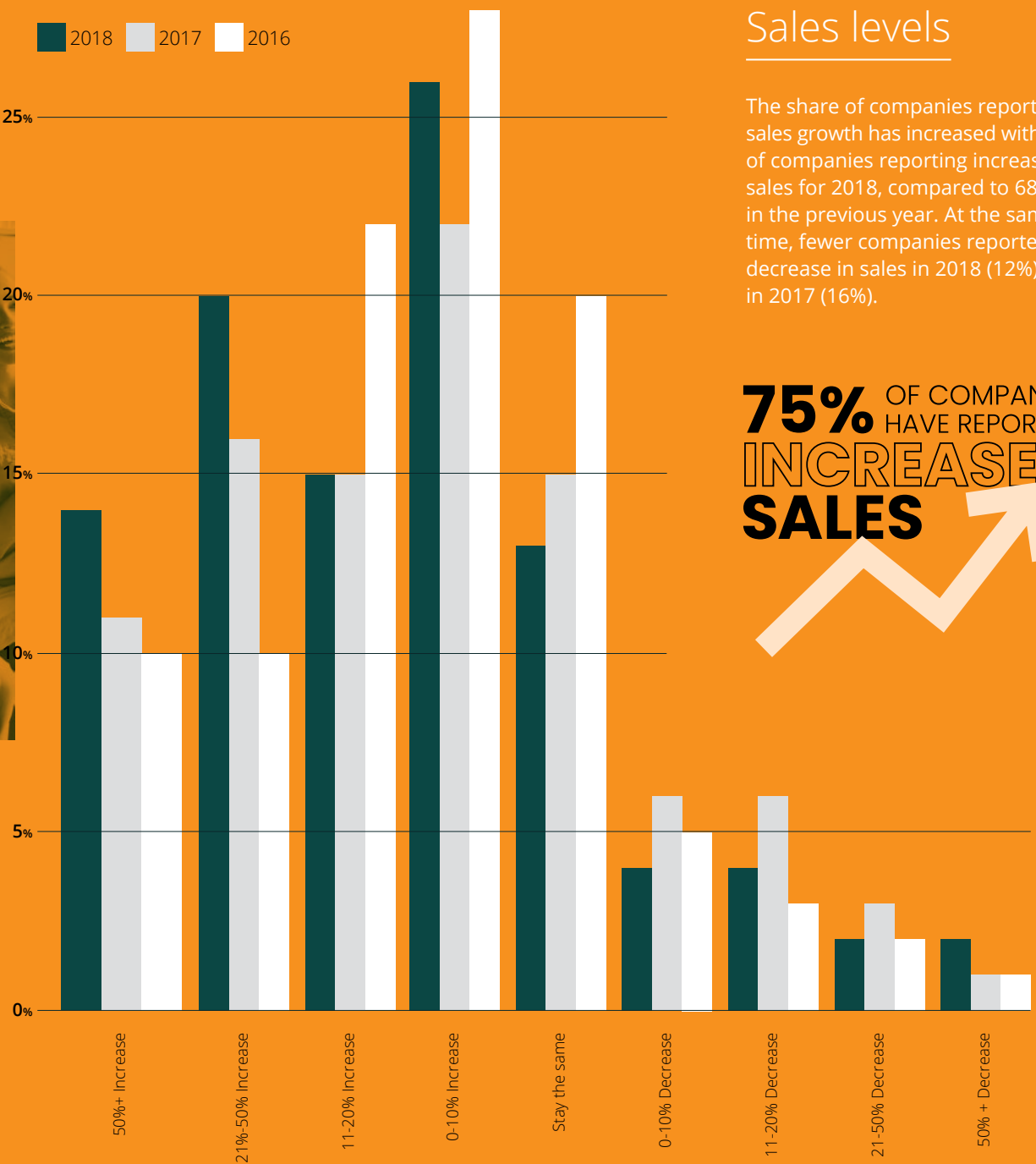


Sectors being supplied

The industry supplies a wide range of sectors - the top four being the public sector (13%), financial services (12%), energy & utilities (9%) and professional services (9%). These show little change between 2018 and 2019 with a slight increase for financial services and electronics and slight decreases for professional services and IT & telecommunications.

Asked about expected demand for the next 12 months, 78% of respondents supplying the financial services sector expect an increase, followed by 76% of those supplying the professional services, energy & utilities (74%), public sector (69%) and IT & telecommunications (68%) sectors. A decline in demand is anticipated by 12% of IT & telecommunications and 11% of manufacturing and electronics sector providers.

Review of 2018



Sales levels

The share of companies reporting sales growth has increased with 75% of companies reporting increased sales for 2018, compared to 68% in the previous year. At the same time, fewer companies reported a decrease in sales in 2018 (12%) than in 2017 (16%).

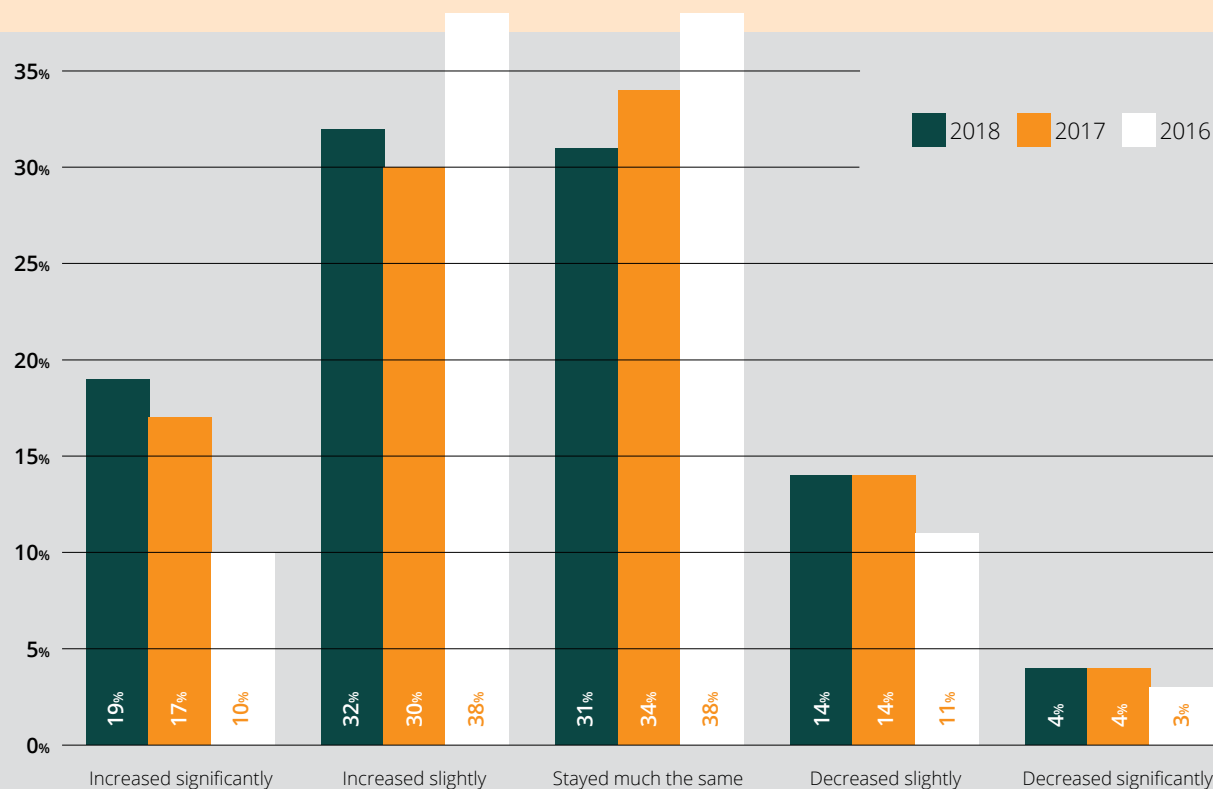
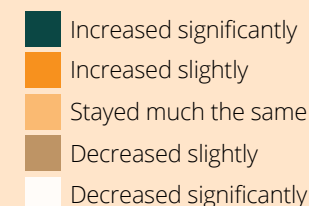
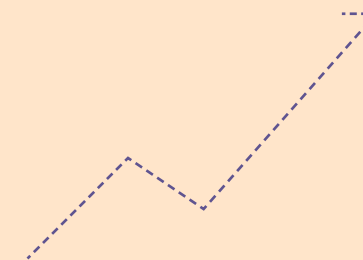
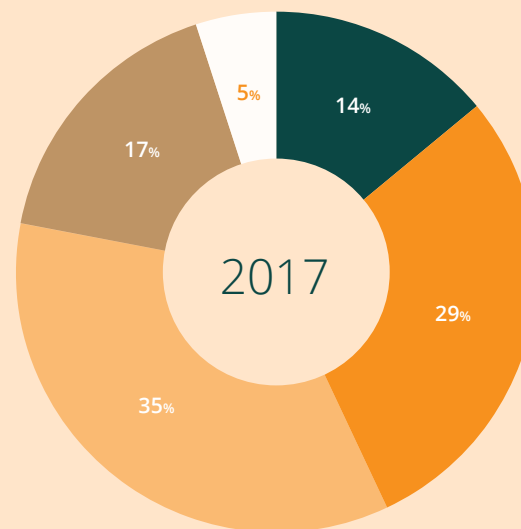
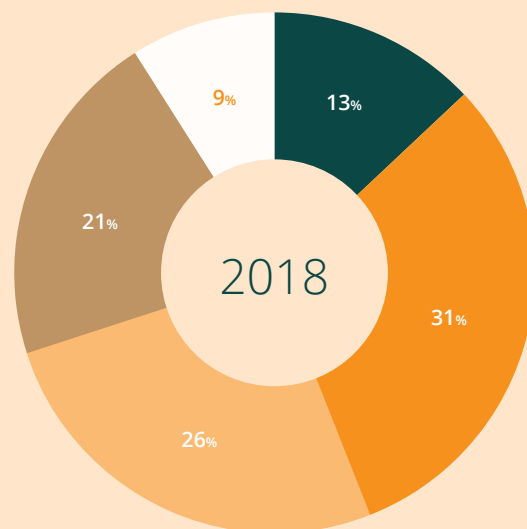
75% OF COMPANIES HAVE REPORTED **INCREASED SALES**

2018 Sales

Actuals compared to budget

at the beginning of 2018

Compared to 2017, slightly more respondents (44%) reported that actual sales were as good as or better than forecast (43% in 2017). For 26% of businesses, actuals were very much in line with their original forecasts, compared to 35% in 2017. A further 30% reported that actual results were worse than expected (up from 22%).



Profit margin performance in 2018 compared to 2017

A larger share of businesses have reported increased profit margins in 2018 (51%) compared to 2017 (47%).

A significant number of respondents have been able to increase profit margins over the last years, whilst the share of businesses experiencing significantly decreasing margins has remained at a low level across all three years.

Outlook for 2019

72% of businesses have a very optimistic or optimistic view for 2019, which is down slightly on last year (80% in 2018). At the same time, the share of respondents having a pessimistic or very pessimistic view for the current year has increased from 8% to 17%.



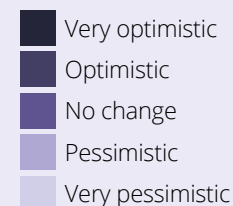
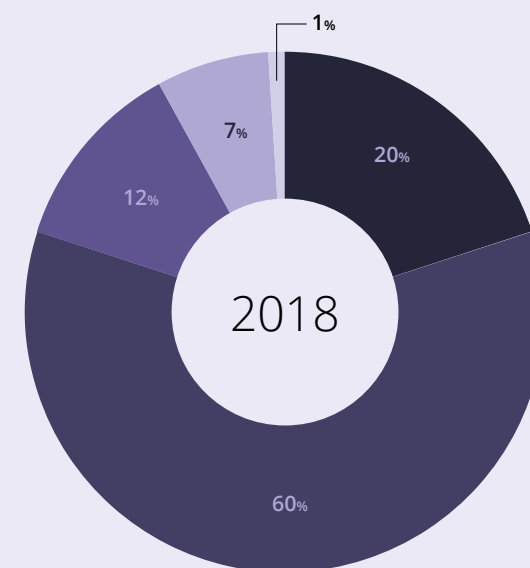
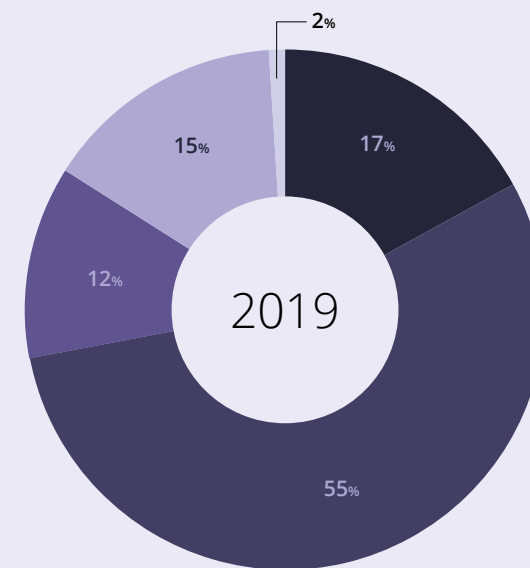
72% OF BUSINESSES HAVE AN OPTIMISTIC OUTLOOK FOR 2019

31% of respondents linked their optimism to the introduction of new products, strong demand for existing products and services or a growing market (down from 40% in 2018). 10% of companies are optimistic because of a generally good outlook in their market. The share of respondents linking their future outlook to the political situation, mainly Brexit, has doubled from 9% in 2018 to 18% this year.

More respondents are dealing with positive challenges like breaking into and growing in new markets (up by 7%) and managing general business growth (up by 5%).

The top three challenges for 2019 are staff recruitment and retention, mentioned by 52% of respondents, followed by the current political situation (41%) and sales and winning new business (30%). These were also the most common challenges in 2018 but there have been increases in both staff recruitment and retention (up by 7%) and the political situation (up by 24%). The number of businesses challenged by economic volatility and changes in their markets has also increased (up by 10%).

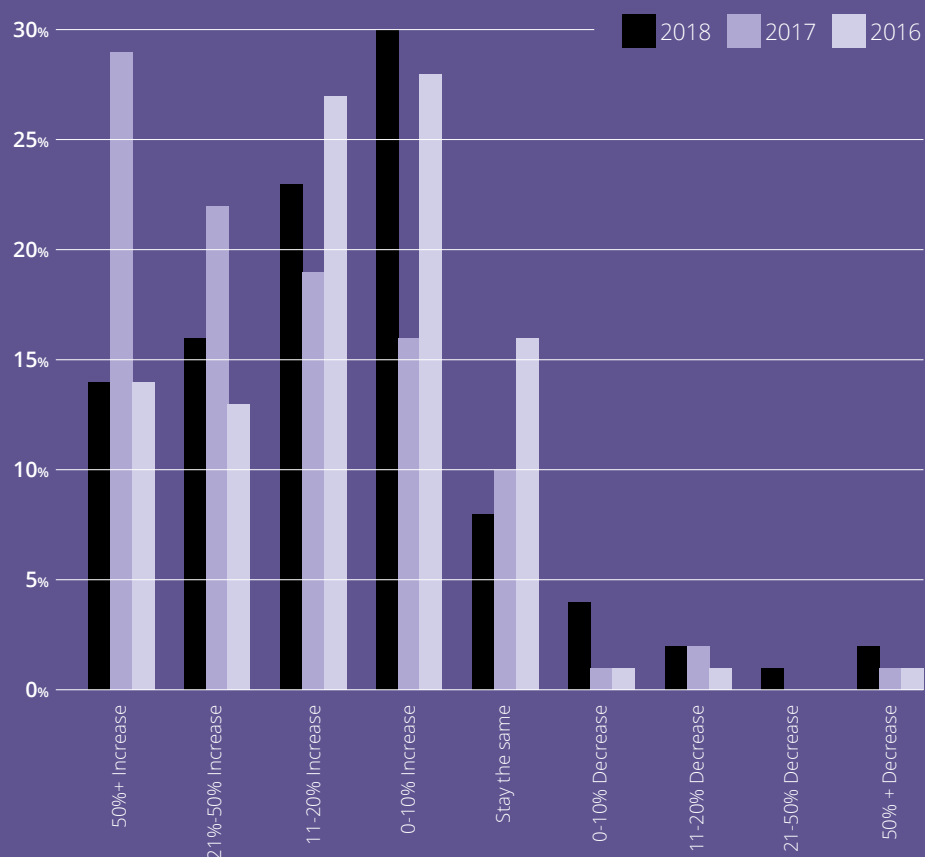
In this year's survey, we asked respondents if and what steps they have taken to prepare for Brexit. About a third had not taken any steps, some because they felt that there is too much uncertainty. 9% of respondents had engaged with or offered practical support to the non-UK nationals in their teams, 7% have developed a Brexit plan. 5% have set up offices or subsidiaries in another country and another 4% are considering such a step or have taken steps to prepare it in case it becomes necessary. 5% mentioned that they are developing or adapting products and services to stay competitive or respond to changing customer needs due to Brexit.



Expected change in sales over the next 12 months

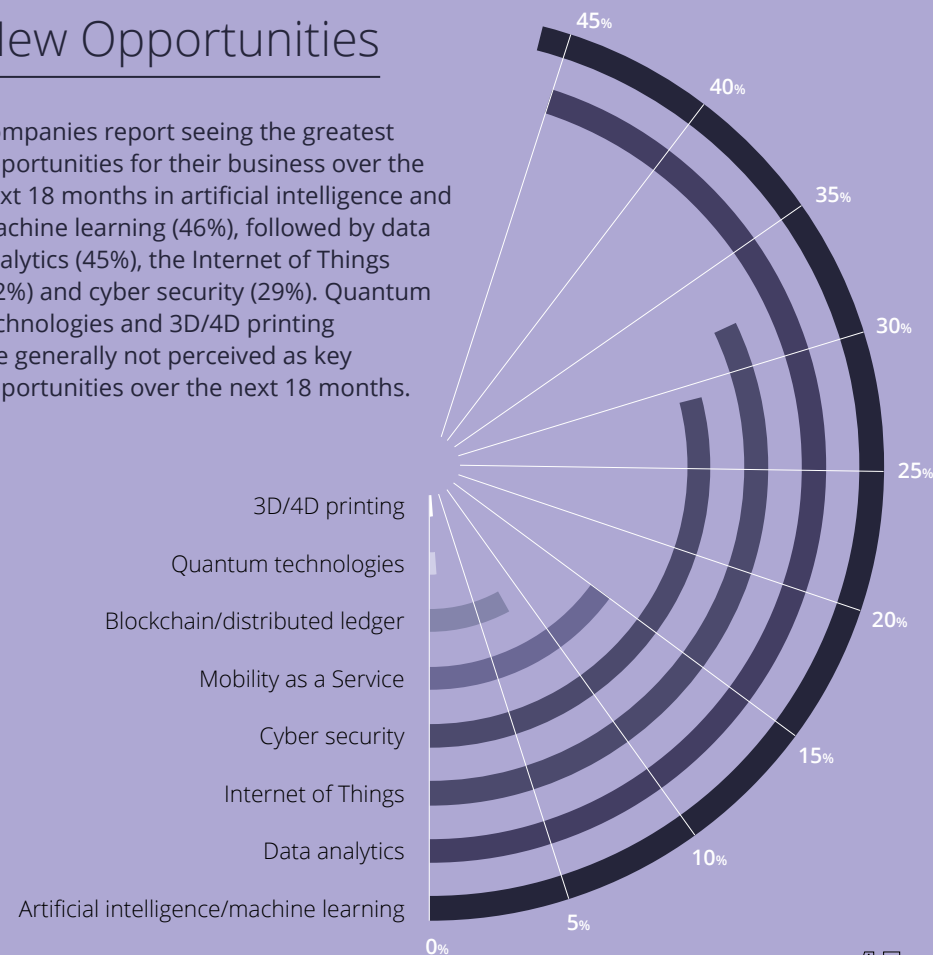
83% of companies predict an increase in sales (86% in 2018) and 8% expect them sales to stay the same. The share of respondents expecting sales growth of more than 20% has decreased considerably compared to the 2018 survey. However, 2018 was an exceptional year in that respect and the expected sales increases in 2019 are similar to those in 2017.

91%
OF BUSINESSES
SALES TO
INCREASE
OR STAY
THE SAME



New Opportunities

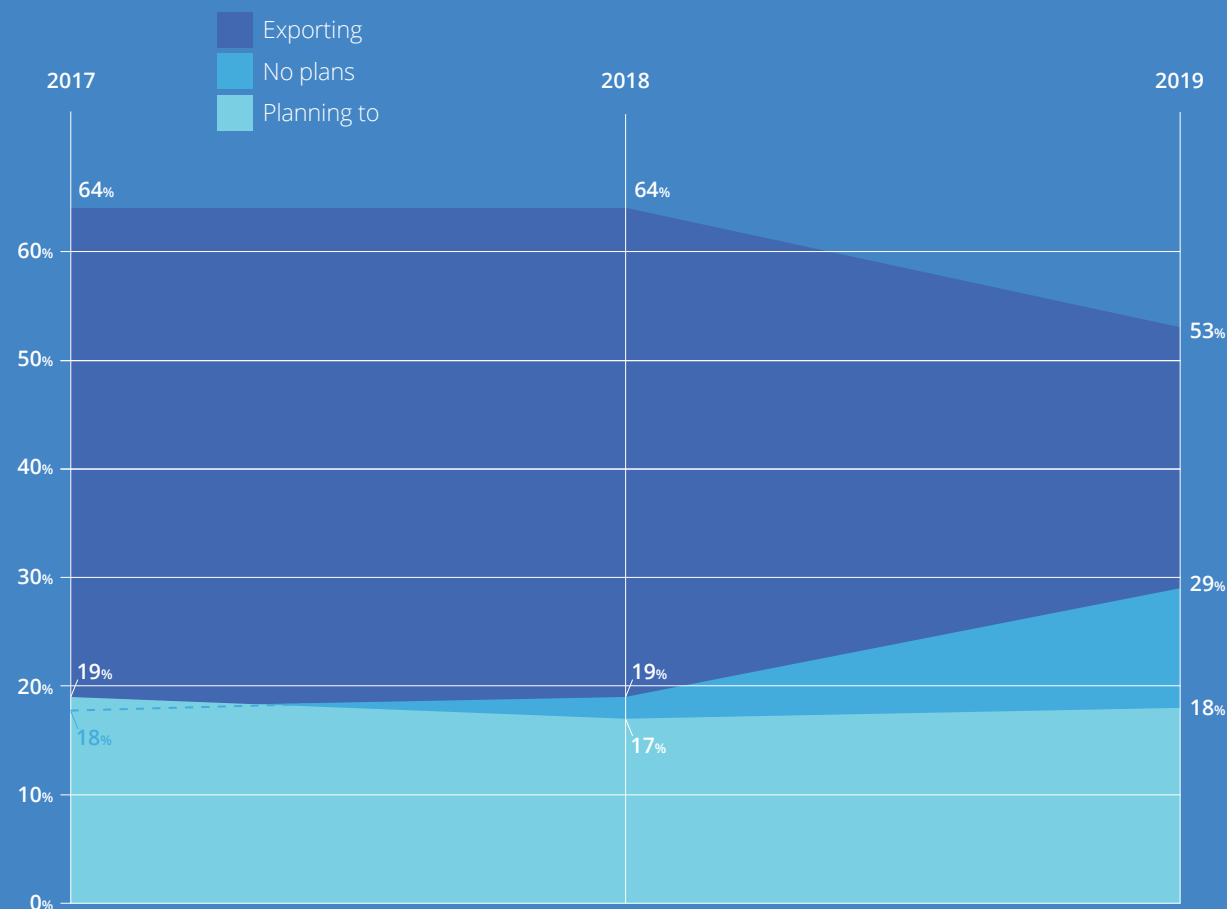
Companies report seeing the greatest opportunities for their business over the next 18 months in artificial intelligence and machine learning (46%), followed by data analytics (45%), the Internet of Things (32%) and cyber security (29%). Quantum technologies and 3D/4D printing are generally not perceived as key opportunities over the next 18 months.



International Opportunities

Export levels

Engagement in international markets has dropped with 53% of respondents reporting that they are already exporting (64% in 2018 and 2017). The share of responding businesses planning to sell internationally has remained largely stable while a larger share has no plans to export.



Export markets

Top markets in 2018 / Most attractive in 2019

The top three current export markets remain the same as in previous years, the Rest of the UK (RUK), Europe, and North America. RUK leads this ranking again after Europe had moved into top place for the first time last year. The most attractive markets for 2019 are Europe, North America and RUK. Compared to last year's outlooks, Europe has gained in attractiveness whereas RUK has lost.



Employment and Skills



Digital technologies employment in Scotland

In 2017 (the latest available ONS data), 62,000 people were employed in digital technologies companies, a decrease of 6.1% compared to 2016. This is similar to the reduction in Great Britain (no UK data available) of 5.7%. The number of people working in digital technologies roles across the whole economy (including in the tech sector) is higher, at around 96,000 people, representing 4% of the Scottish workforce (as of September 2018).¹

40% of people in digital technologies roles work in the tech industry whereas 60% are employed in other sectors, e.g. financial services and healthcare. This highlights that digital technologies are increasingly essential to all sectors of our economy. The number of people in technology related roles is now growing at a faster rate in non-tech sectors than in the digital technologies industry itself.

Digital technologies roles offer both a wide variety of career opportunities and above average compensation. In 2016, the average annual salary for digital technology jobs was £37,500, 30% higher than the Scottish average of £28,000. Since 2010, digital technologies salaries have increased at a faster rate (15-20%) than salaries across the wider economy (11%).

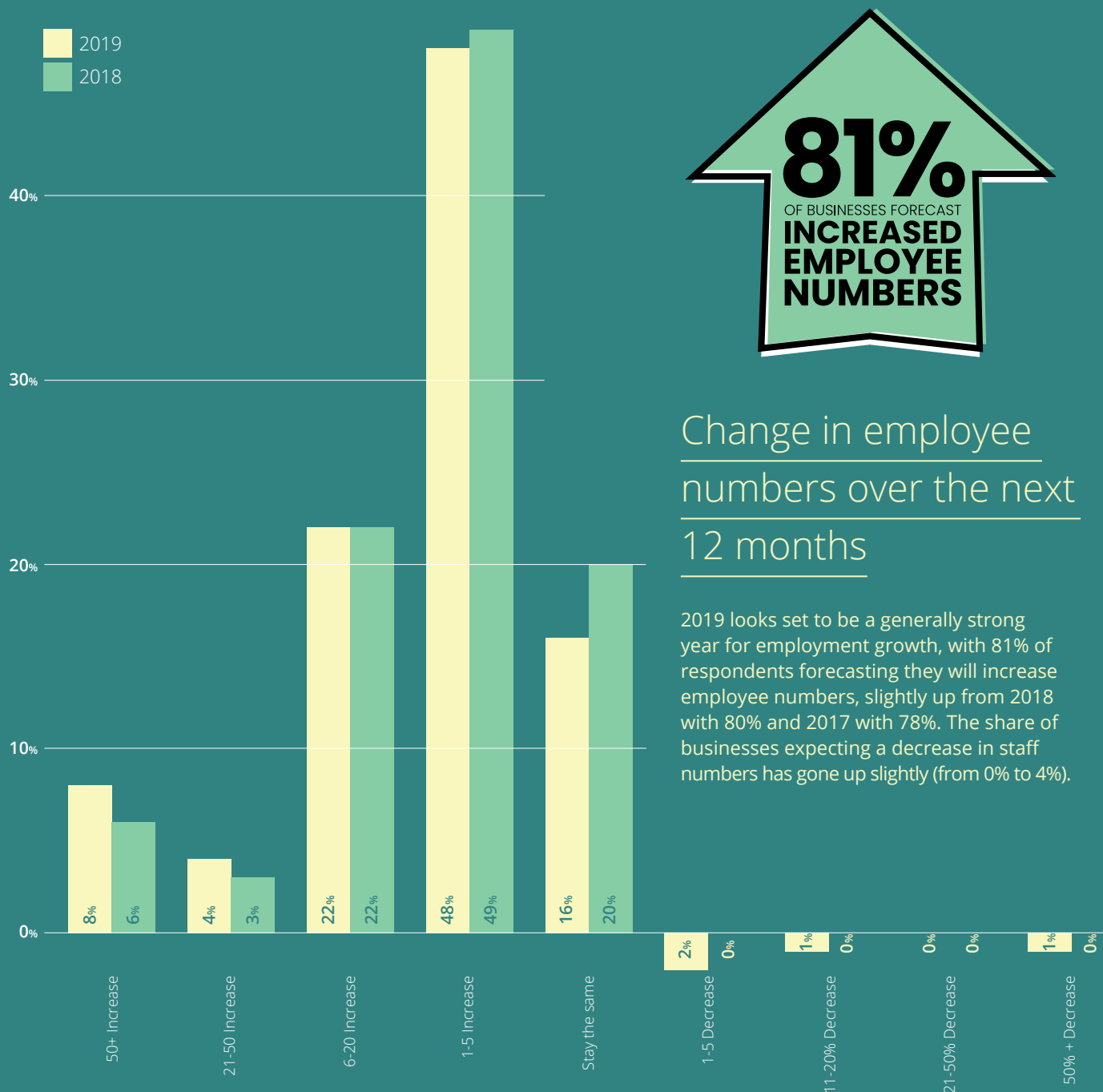
12,800 digital technologies job opportunities are created every year, partly in response to people retiring from or leaving the industry but also through growing demand for these skills. However, not enough college and university leavers, apprentices and career changers enter the labour market to keep up with this demand. For example, of 4,381 computing science graduates leaving Scottish universities in 2014/15, only 73% moved into employment (another 16% going onto further studies). More positively, the number of digital technologies Modern Apprentices (MAs) almost doubled between 2013/14 and 2015/16. The overall number is still low (950 MAs) but the trend is upwards. Research to update skills demand and supply statistics has been commissioned by SDS and is currently being undertaken.

The proportion of women in Scotland's digital technologies workforce has increased by nearly a third to 23.4% in 2017 after having stagnated around 18% for several years.² Research is underway to identify the drivers behind this positive development.

ScotlandIS is involved in a variety of initiatives to address the digital technologies skills gap. Further details can be found in the chapter "ScotlandIS commentary" at the end of this report.

¹ Please see the chapter on methodology at the end of the report for details on the definition of the digital technologies sector and sources of the figures in this employment overview.

² <https://www.skillsdevelopmentscotland.co.uk/news-events/2018/october/record-number-of-females-join-the-tech-sector/>



Location of talent

The majority of respondents (70%) continue to expect to find most of their new staff in Scotland. The remaining 30% expect the majority of their new talent to come from either other parts of the UK, Europe or the rest of the world. There is decreased confidence in recruiting from Europe whilst the share of companies planning to recruit mainly from the rest of the world has increased.

2019 / 2018 / 2017

Scotland

70% / 70% / 73%

Rest of the UK

17% / 12% / 17%

Europe

5% / 11% / 5%

Rest of the World

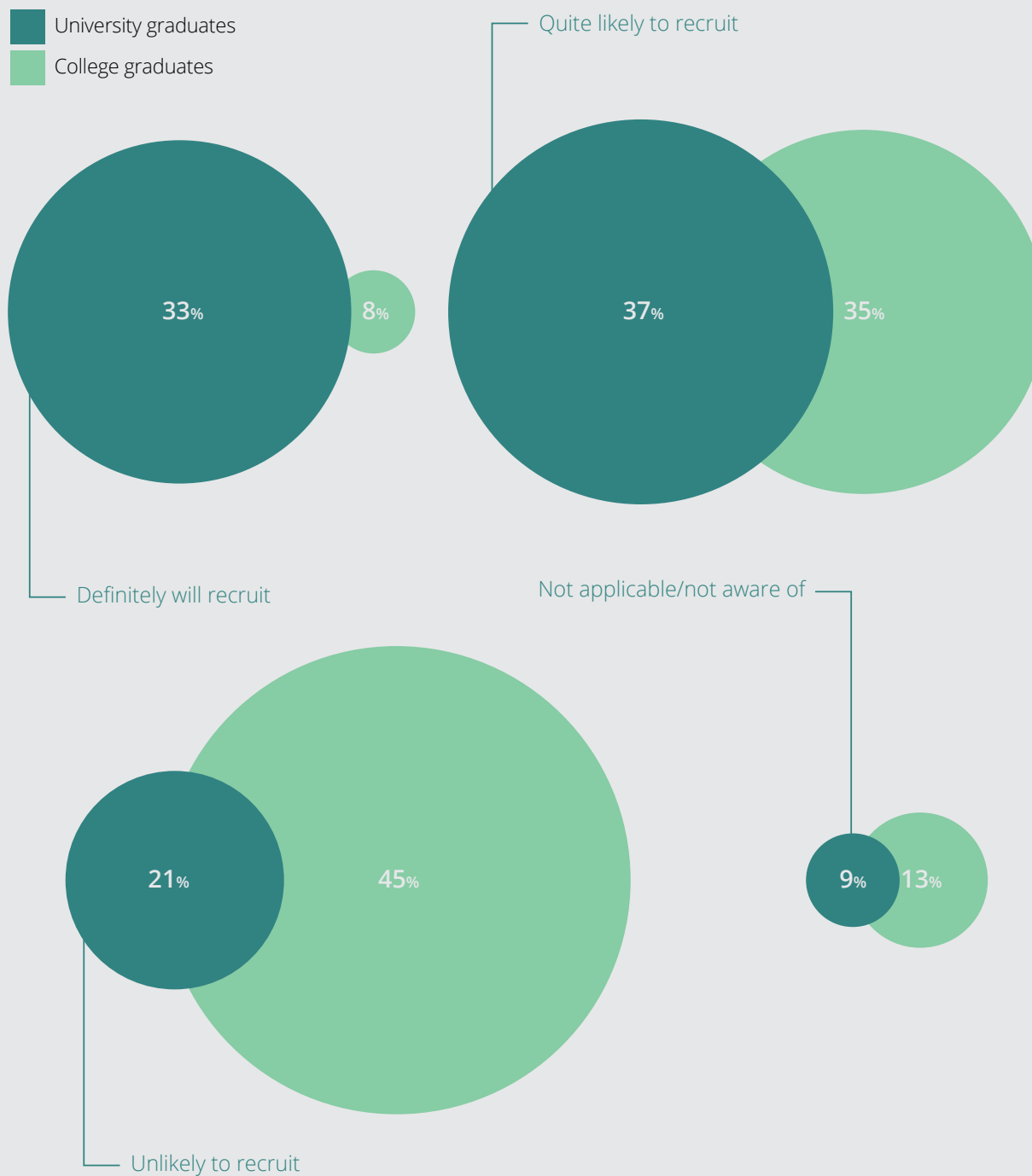
9% / 7% / 4%



Recruitment of college and university graduates

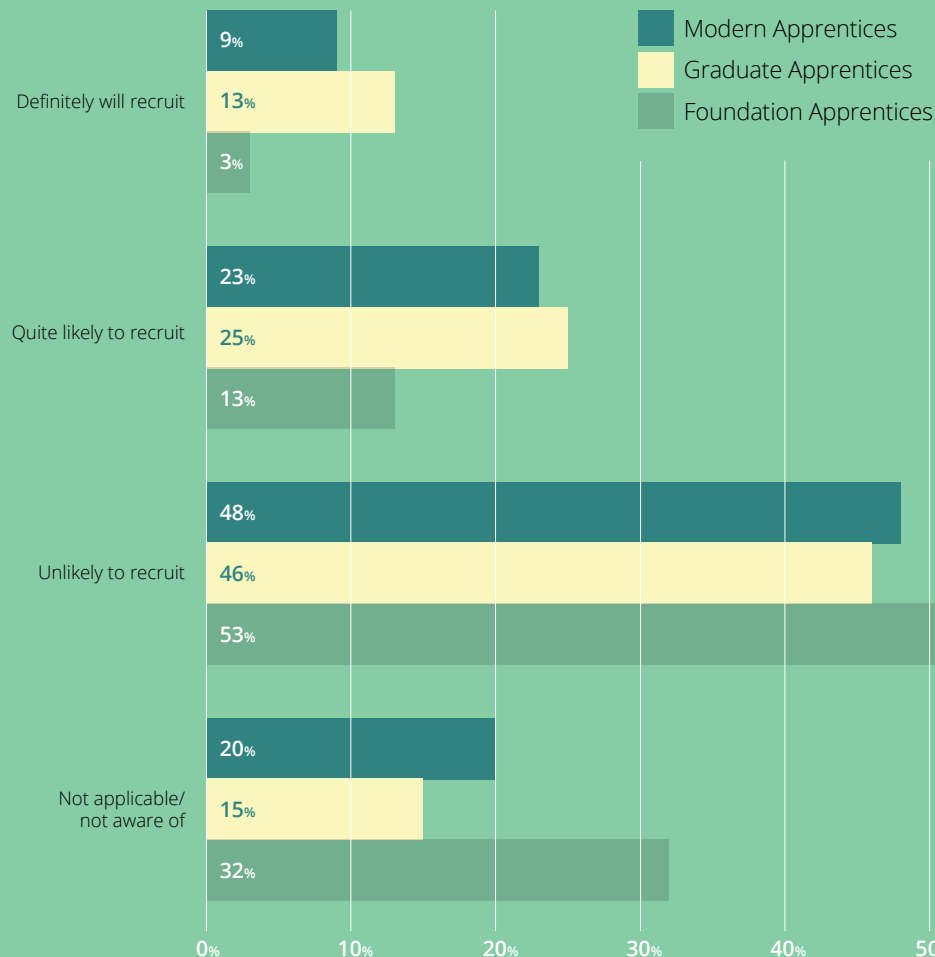
Demand for the recruitment of university graduates remains strong with 70% of all businesses reporting they are definitely or quite likely to recruit graduates in 2019. This demand has remained largely stable around 70% over the last few years.

For the first time, we asked companies how likely they are to take on college graduates. 43% of respondents indicated they are likely to recruit from colleges, whilst 45% are unlikely to do so.



Recruitment of apprentices

32% of respondents report that they are definitely or quite likely to recruit Modern Apprentices in 2019. This is a drop after last year's high of 45% but this may have been impacted by this year's inclusion of Graduate and Foundation Apprenticeships in this question. Respondents are actually more likely to take on a Graduate Apprentice (38%) than a Modern Apprentice (32%). Foundation Apprenticeships are least popular and employers are less aware of them than of the other types of apprenticeships on offer.



Tackling the technology gender gap

Given the skills gap in our industry and overall low proportions of women in digital technologies roles, we asked survey participants this year what support would be useful to their business when trying to improve the gender balance in their workforce.

More than 40% of respondents felt that they don't need any support, in some cases because they already had a balanced workforce. 14% of responding companies indicated that there are not enough women in the talent pool and amongst applicants. 12% feel that support is needed to increase the number of females studying digital technologies related subjects in schools, universities, etc. Others would appreciate more networking opportunities with potential female candidates or opportunities to promote their companies and the wider industry to women. A small number of respondents would like help with recruitment practices and communications and some suggest that financial support for training and organisational changes would be helpful.



Most in demand skill sets

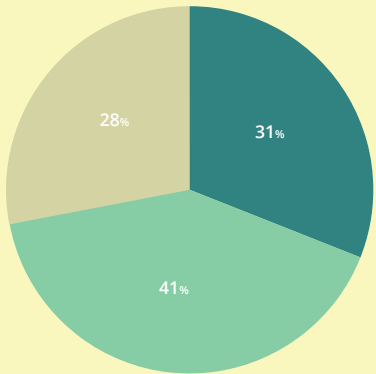
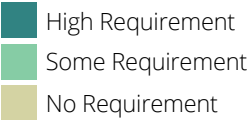
Sales and marketing is the most in demand skill set with 86% of respondents indicating some or a high requirement, followed by 72% with a requirement for software and web development skills. 55% of respondents require infrastructure support and management skills. These figures are largely in line with demand in previous years.

We introduced two new categories for this year's survey: data analytics and artificial intelligence/machine learning (AI/ML) to capture information on these increasingly important areas. Demand for both of these skill set is similar with 55% of respondents requiring data analytics skills and 59% requiring AI/ML skills.

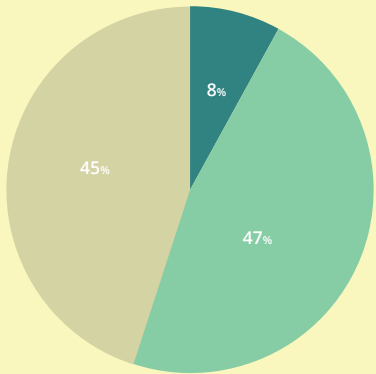
Amongst larger companies the greatest demand is for data analytics and AI/ML skills, with 9 out of 10 larger companies seeking these skills, which is considerably higher than in the overall sample. The demand for sales and marketing (85%) and software & web development skills (73%) is in line with the survey average.

Medium sized businesses indicate strong demand for sales and marketing skills (78%), followed by software & web development (69%) and AI/ML skills (58%). The demand for all skills sets included in the questions is slightly lower amongst mid-sized businesses than in the overall sample.

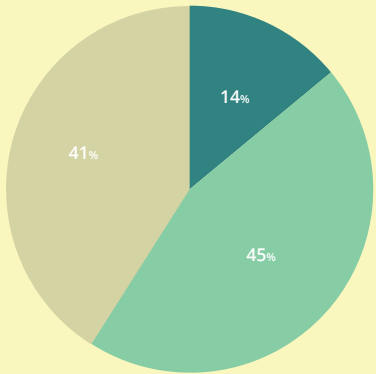
For smaller businesses, sales and marketing (89%) and software and web development (73%) are the most in demand skill sets. Data analytics skills are required by 54% to aid business growth in smaller companies, followed by infrastructure support & management (53%) and AI/ML skills (50%).



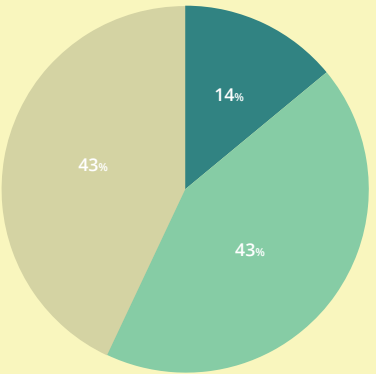
Software and Web Development



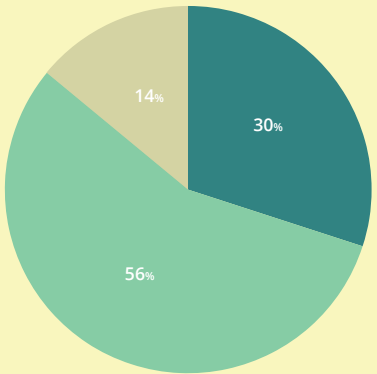
Infrastructure & Support Management



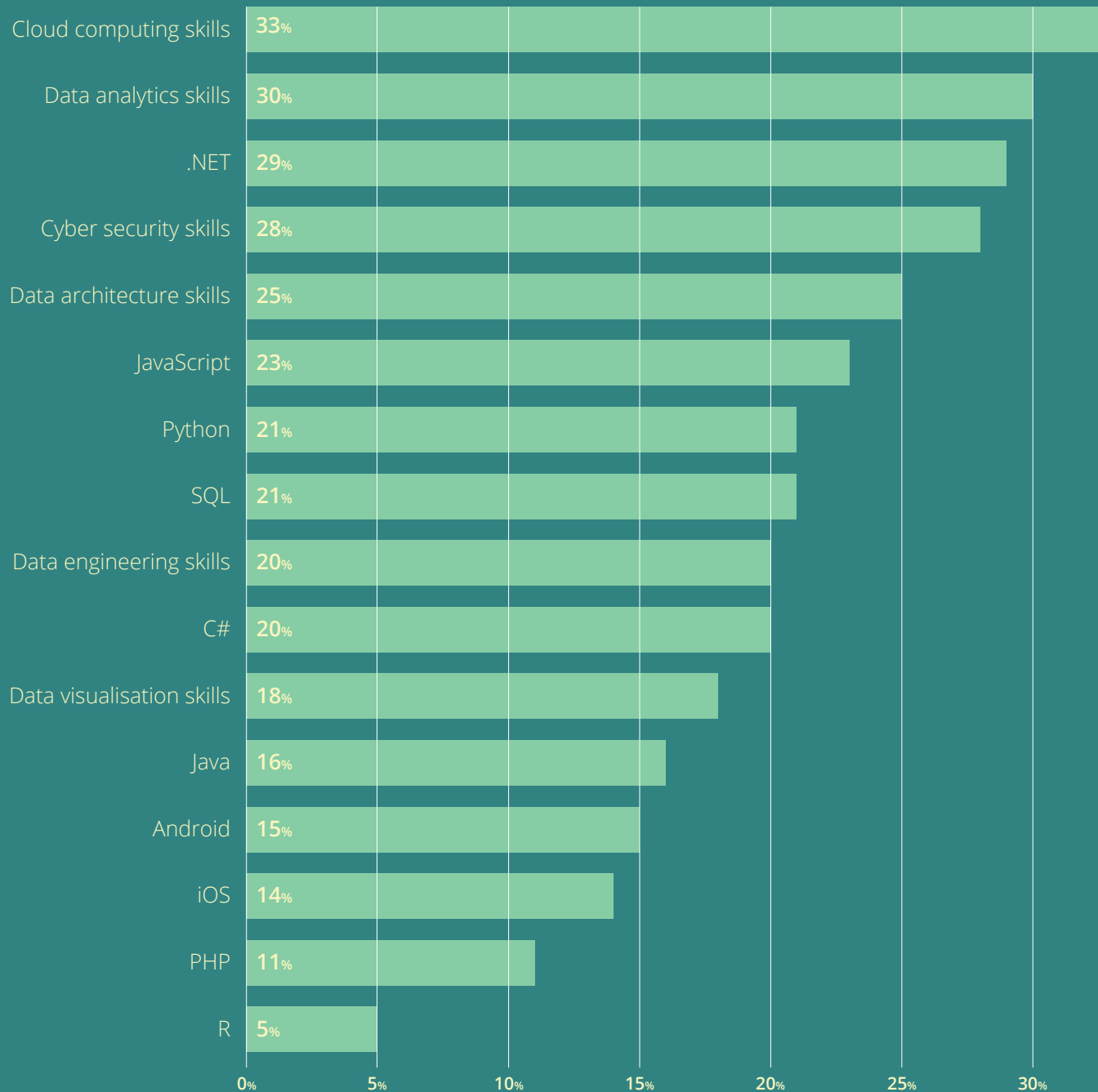
Data Analytics



Artificial Intelligence/ Machine Learning



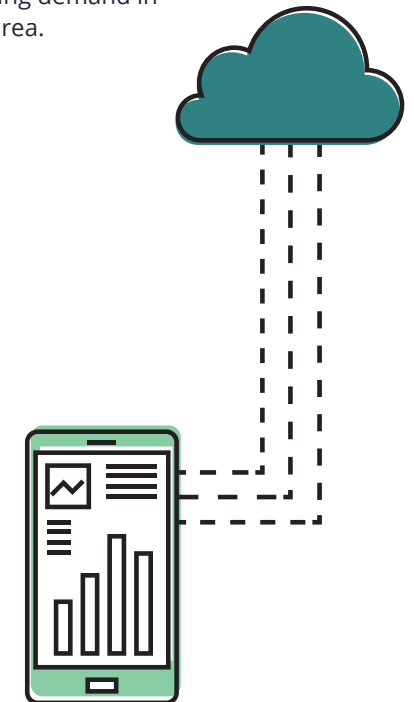
Sales & Marketing



Technical skills

Respondents showed a continuing strong demand for software development skills, with .NET, JavaScript and Python being most in demand.

Looking beyond software development, the greatest demand is for cloud computing and data analytics skills. This year, we included several new categories for data related skills (architecture, engineering and visualisation, SQL and R) to get a better understanding of the growing demand in this area.



Data

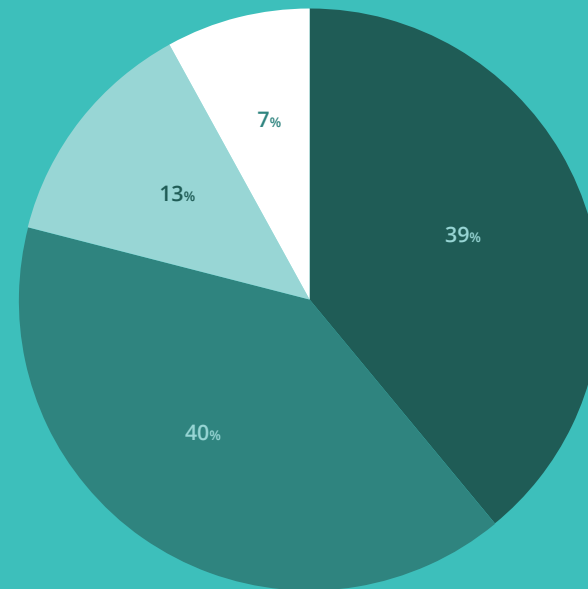
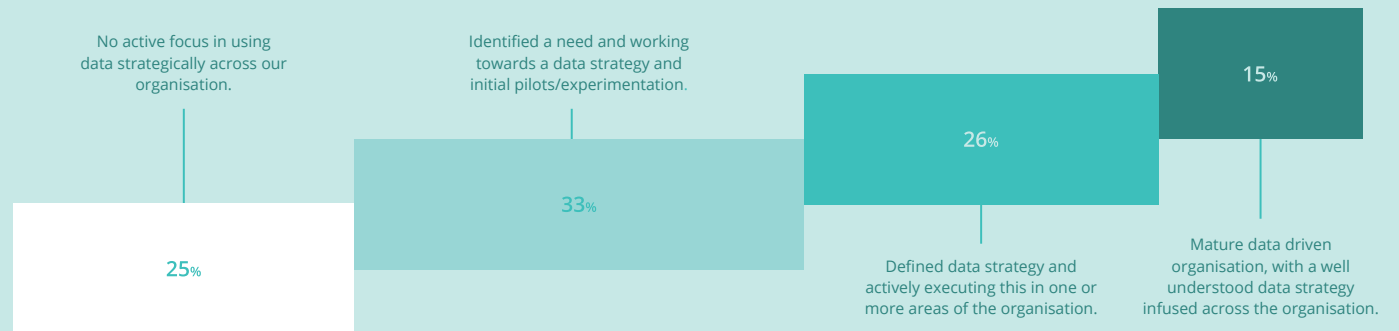
In cooperation with The Data Lab, we included a number of questions on the use of data and the need for data related skills in this year's survey.

When we asked companies about the greatest opportunities for their business over the next 18 months, the top three answers were all data related. Nearly half of all respondents see the greatest opportunities in artificial intelligence and machine learning (46%), followed by data analytics (45%) and Internet of Things (29%).



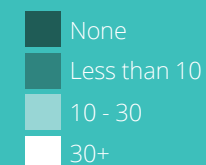
Data maturity

Asked about their maturity in using data to drive value across the organisation, a third of respondents report having identified a need and taking the first steps towards a strategy and pilots. Just over a quarter have already defined a strategy and are actively implementing it. 15% of respondents identify as a mature data driven organisation whilst a quarter have no active focus in using data strategically.



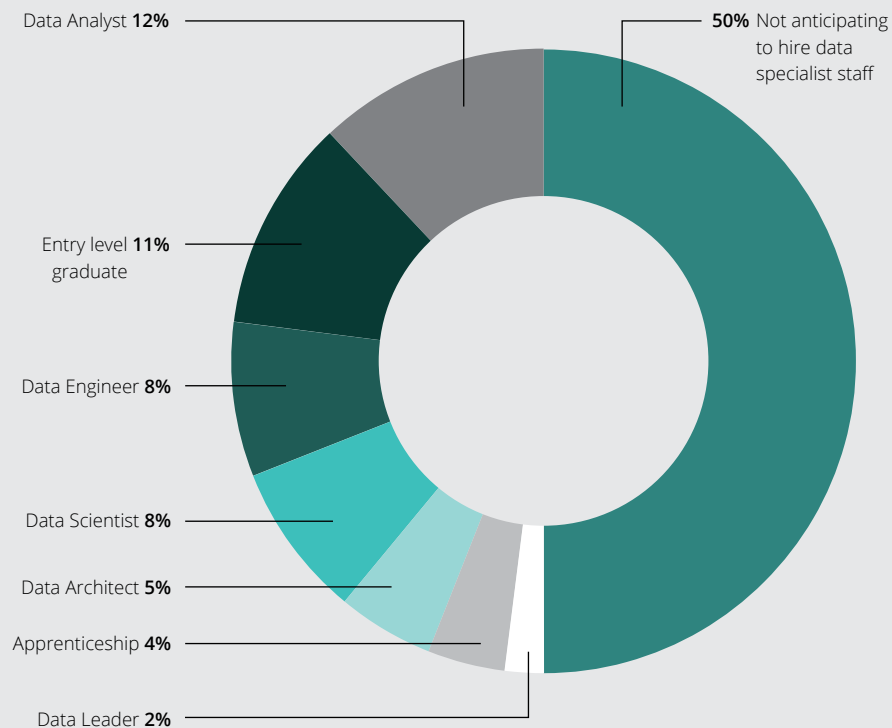
Data specialist staff currently employed

The majority of respondents currently employ just a small number of data specialist staff (analysts, scientists, engineers, architects, managers) and 39% don't employ any.



Data skills needs

Half of all respondents anticipate hiring data specialist staff over the course of 2019, with data analysts and entry level graduates being most in demand.



Demand for specific data related skill sets is particularly high, with 55% of respondents requiring data analytics skills and 59% requiring artificial intelligence and machine learning skills. A quarter of companies expect demand for data architecture skills, followed by SQL (21%), data engineering (21%) and data visualisation skills (18%). In terms of data related programming languages, 21% of respondents expect demand for Python skills but only 5% for R skills.

Commentary from THE DATA LAB value from data

There is a huge potential for Scotland to benefit both economically and socially through data innovation: Scottish Enterprise estimate this could be worth £20 billion to the country.

This is highlighted in the survey with the technologies or areas of business providing the greatest opportunities for growth over the next 18 months identified as artificial intelligence and data analytics and over half of those surveyed needing to hire talent in these areas.

Many organisations are now actively engaged in using data, with 75% of companies stating they are engaging in pilots, have a data strategy or regard themselves as a mature data driven organisation.

Nevertheless, the survey results highlight that we need to accelerate the execution of that mission and catalyse activities across agencies and initiatives. For example, of those companies surveyed 25% have no active plans to use data strategically and 39% employ no data related staff.

In our experience, to unlock data innovation significant focus is required to educate business leaders in the value of data to their organisation, their responsibilities in data use, how to begin that journey and accelerate that path to value.

Furthermore, whilst much of the focus over the past five years has been creating a pipeline of data analysts and scientists, organisations require a breadth of talent to use data in production and at scale successfully.

The survey identified a number of areas as critical to success in using data, including cloud computing, data architecture, data engineering and data visualisation. We need to increase the diversity of areas that we invest in, covering technical skills development for both new talent and professional development of existing staff. There is a clear need to stimulate supply side organisations to deliver this.

There has been significant investment and progress in catalysing data-driven innovation during the past five years. This report provides clear signals that Scottish companies are moving in a positive direction and we need to do even more to accelerate the delivery to realise the full potential for our country.



Brian Hills,
Head of Data, The Data Lab

Benchmark 1: Smaller Companies



Reflections on 2018

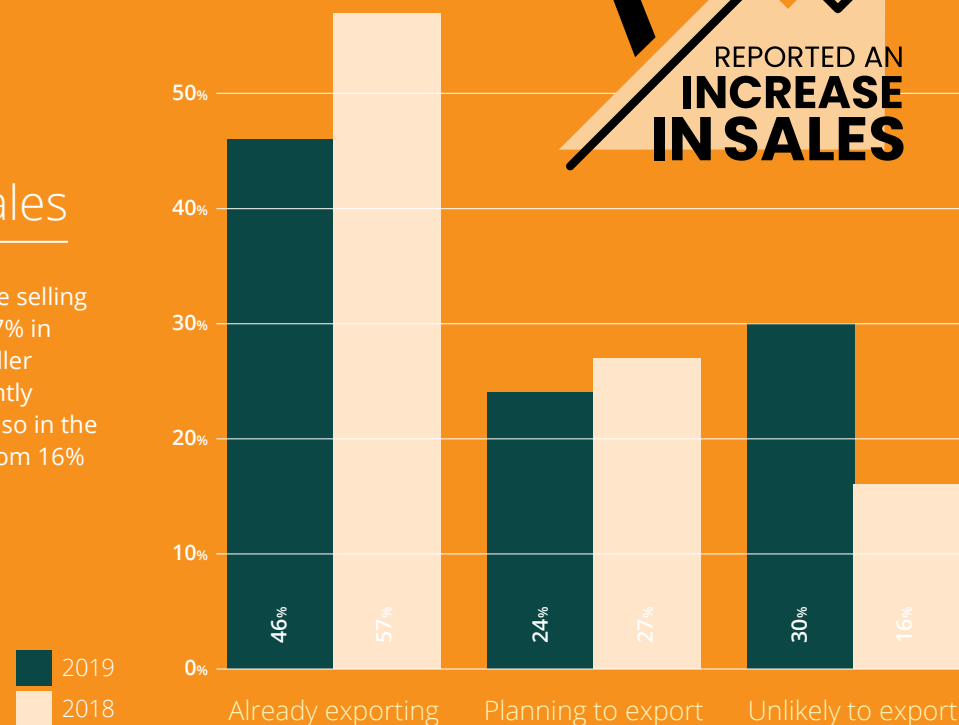
2018 was a good year for most smaller businesses, with 74% experiencing an increase in sales (up 10% from 2017) and 47% reporting that actuals had increased compared to budget (up from 44%). However, the share of smaller companies recording increased profit margins has fallen from 49% in 2018 to 43% in 2017. Looking forward, 72% have an optimistic outlook for 2019, compared to 83% in 2018.

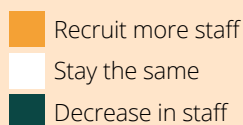
72% 
**HAVE AN
OPTIMISTIC
OUTLOOK FOR 2019**
.....

74% 
**REPORTED AN
INCREASE
IN SALES**

International sales

46% of smaller businesses are selling internationally, down from 57% in 2018. The percentage of smaller companies that do not currently export and are unlikely to do so in the future has nearly doubled (from 16% to 30%).





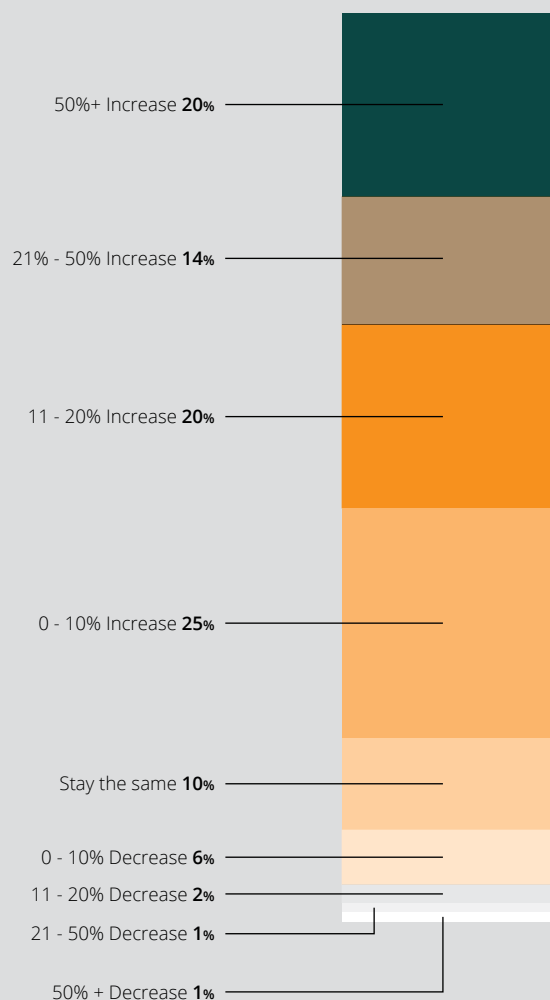
People and skills

77% of small businesses expect to increase employee levels during 2019, similar to last year. A further 20% are not anticipating adding to their head count, (compared to 23% last year).

64% of respondents are likely to recruit university graduates (down from 66% in 2018) and 21% are likely to take on modern apprentices (down from 30%). 44% of small businesses are likely to recruit college graduates, 32% are likely to take on a graduate apprentice but only 11% would take on a foundation apprentice.

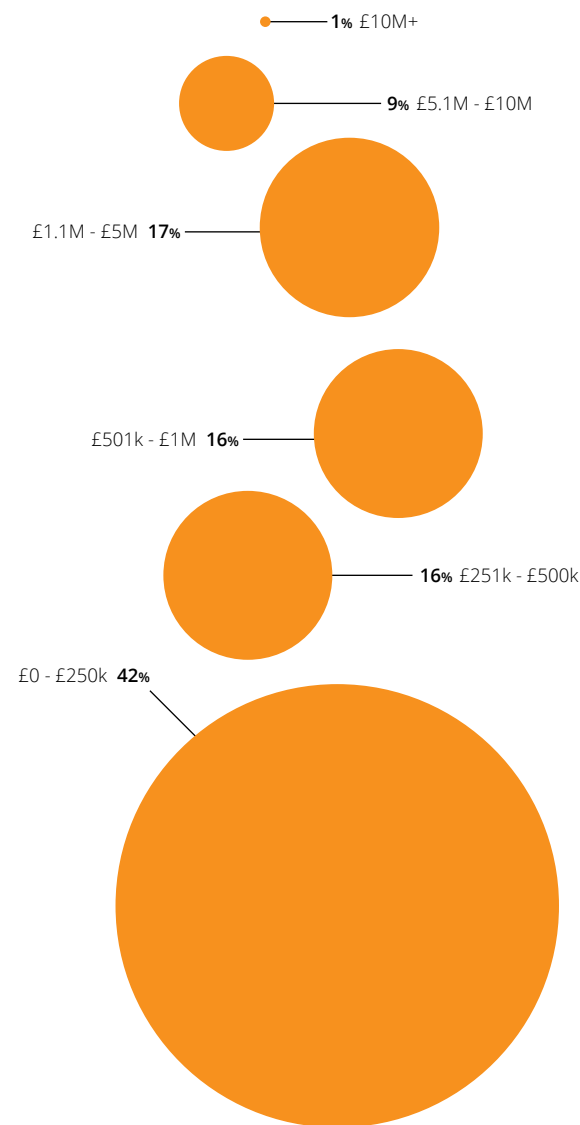
Sales outlook for 2019

The sales outlook for small businesses for 2019 whilst very strong, is slightly less positive than in 2018. 80% of smaller businesses expect their sales to increase over the next 12 months (down from 87%), 10% anticipate they will stay the same, while 10% forecast a decrease in sales (up 4% from last year).



Financial environment

Turnover for 91% of smaller businesses was in the region of £0-£5M, much in line with last year.

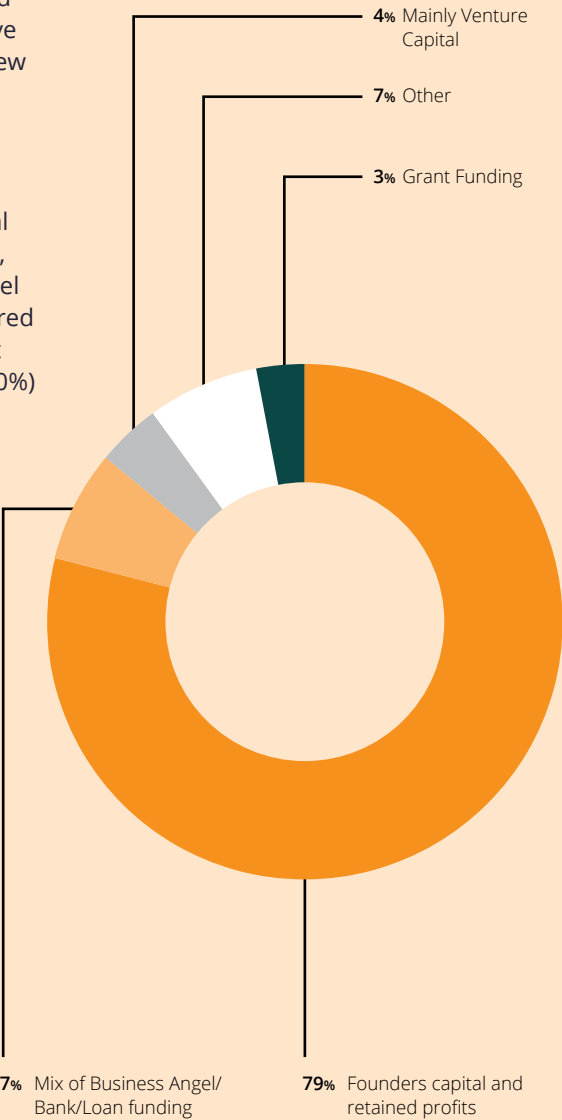


Funding model

Funding for 79% of smaller businesses is generated from founders capital and retained profits and only 7% rely on a mix of business angel, bank and loan funding. These figures have remained stable over the last few years.

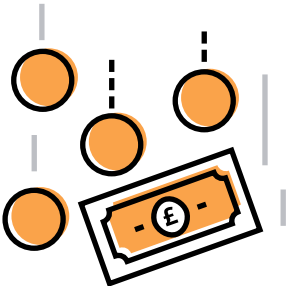
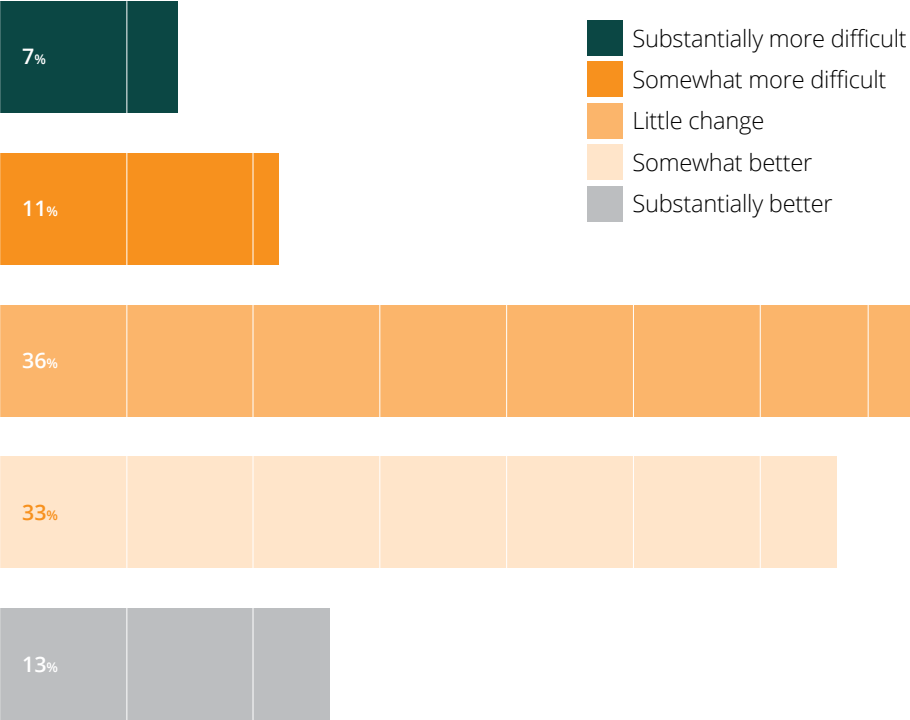
-

For the majority of smaller businesses that need additional finance, e.g. for growth in 2019, private investment such as angel or founder capital is the preferred option (31%), followed by grant funding (25%), bank funding (20%) and venture capital 10%).



Cashflow compared to last year

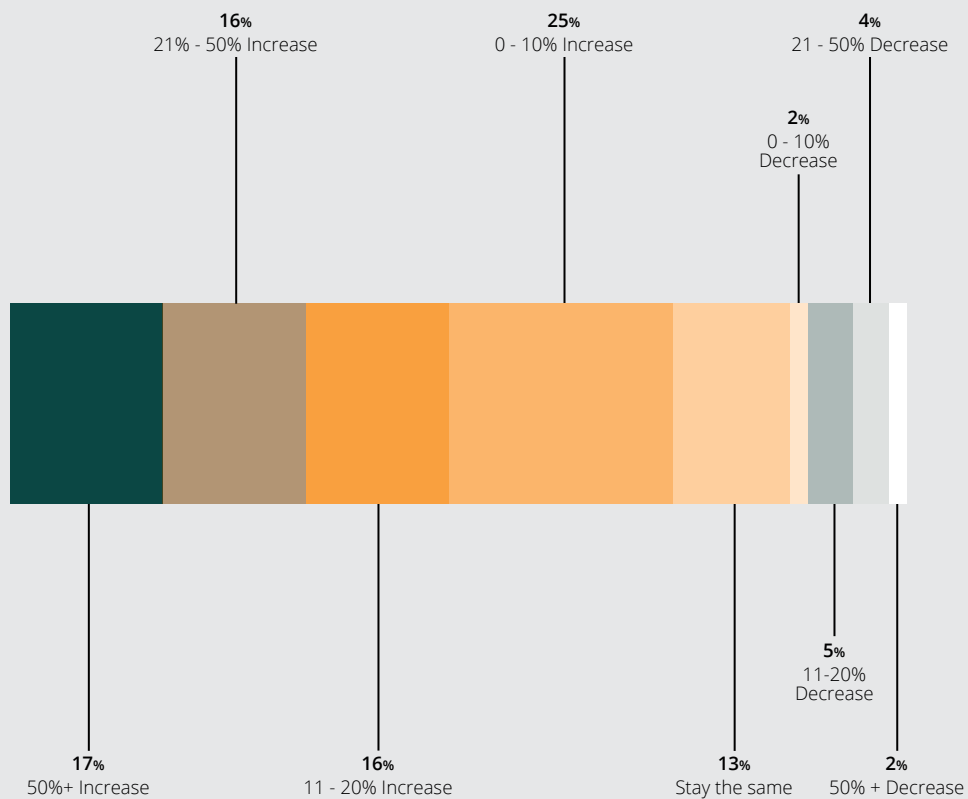
Smaller businesses reported little change in their cashflow compared to 2017. 46% (down 2% from last year) experienced improvements while just 7% reported substantial difficulties. The share of companies reporting cash flow to be somewhat more difficult decreased from 16% to 11%.



CASHFLOW
46%
EXPERIENCED
IMPROVEMENT

2018 sales levels compared with 2017

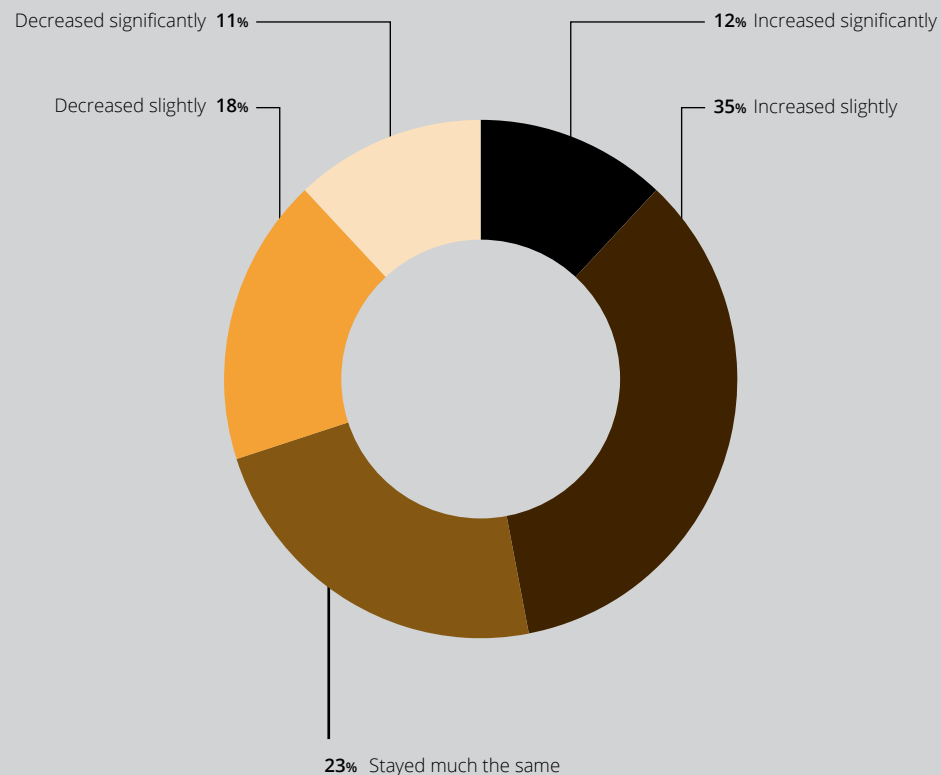
In 2018, 74% of smaller businesses reported an increase in sales compared with 2017, which is up from the previous year (64%). The share of businesses seeing sales levels fall has decreased to 13% (from 17% in 2017).



Actuals compared to budget

47% of smaller companies reported actuals ahead of their 2018 budgets, with a further 23% indicating actuals compared to budget were close to predicted levels.

47%
REPORT ACTUALS **AHEAD**
OF
2018
BUDGET

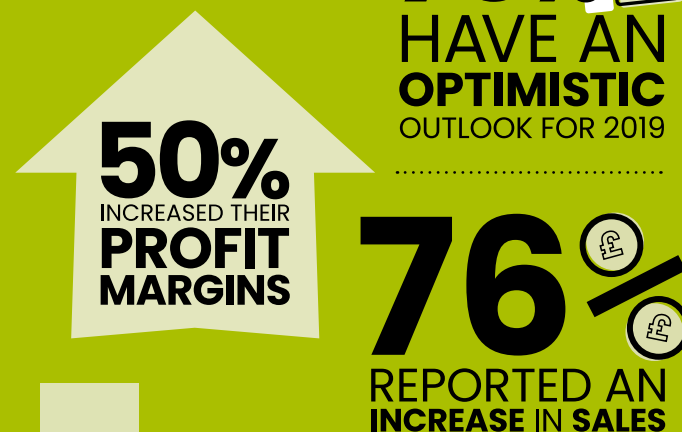


Benchmark 2: Medium-sized Companies



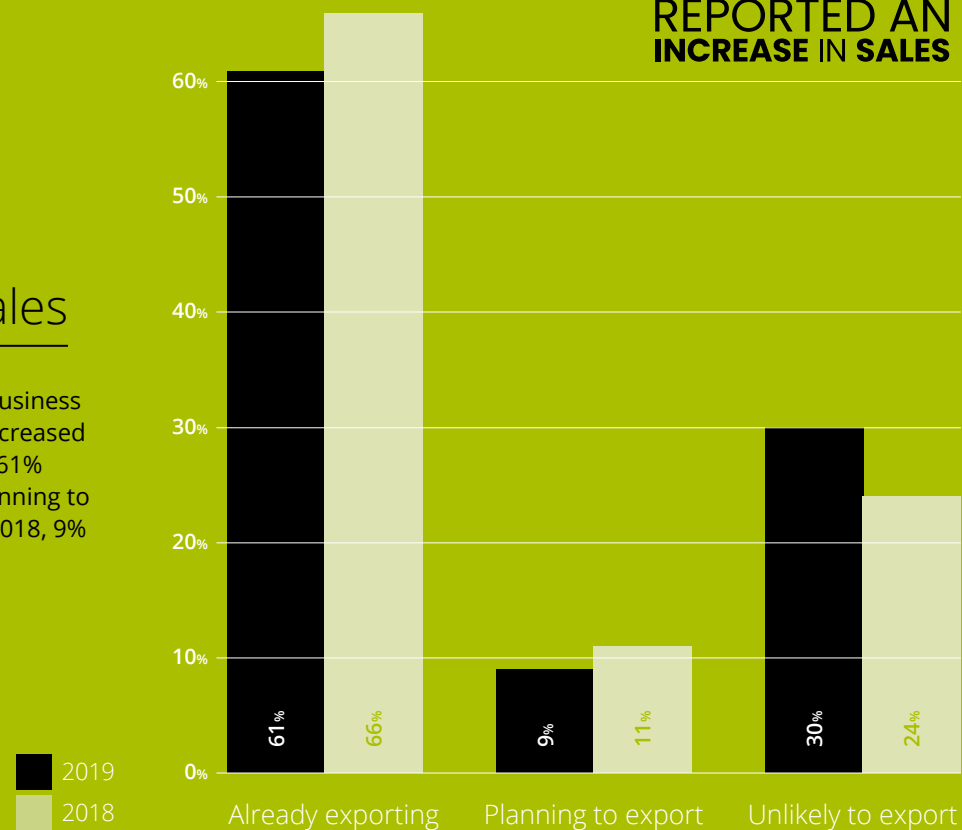
Reflections on 2018

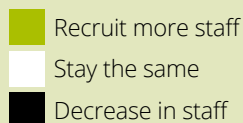
2018 was another good year for medium-sized companies, with 76% reporting an increase in sales and 50% increased profit margins. These figures are largely in line with 2017 results (3% increase for sales and 1% decrease for profit margins). Looking to 2019, 79% of this year's respondents are optimistic (down slightly from 84% in 2018 but in line with the decrease across the whole survey).



International sales

The share of medium-sized business that are already exporting decreased slightly, from 66% in 2018 to 61% and fewer companies are planning to export in the future (11% in 2018, 9% in 2019).





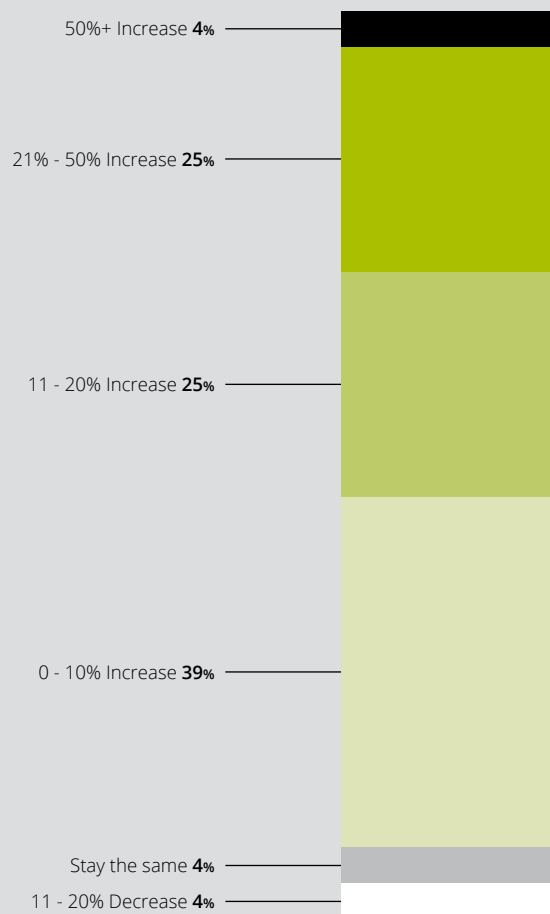
People and skills

89% of medium-sized businesses expect to increase employee levels, slightly fewer than in 2018, when 93% were expecting headcount increases. 7% expect staff numbers to remain the same (same as last year), while 4% expected to reduce staff, up from 0% last year.

81% of respondents are likely to recruit university graduates (down from 84% in 2018) and 47% are likely to take on modern apprentices (down from 60%). 44% of medium-sized businesses are likely to recruit college graduates, 58% are likely to take on a graduate apprentice but only 15% expect to take on a foundation apprentice.

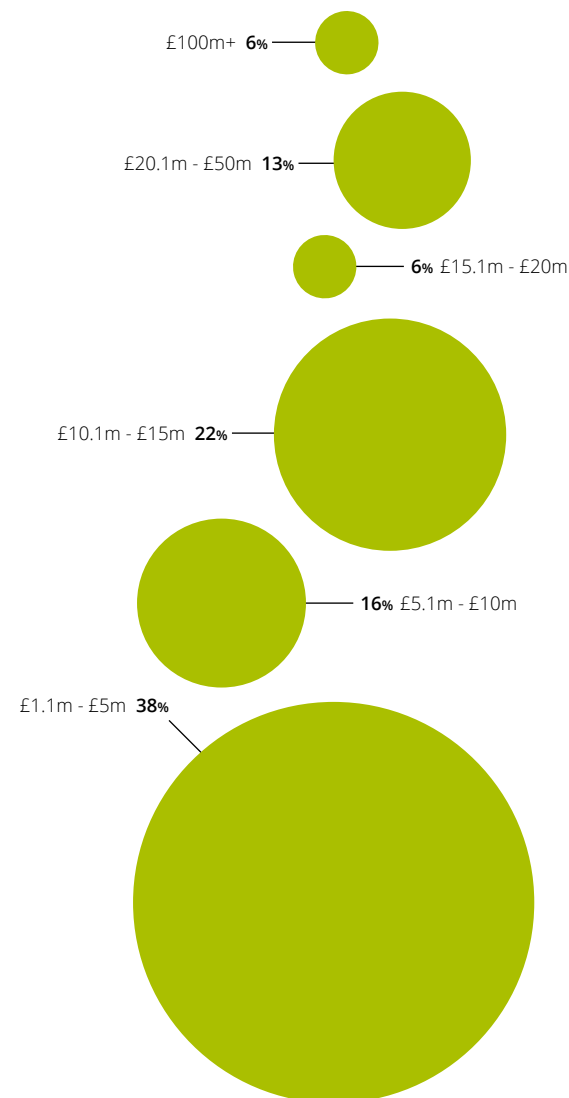
Sales outlook for 2019

Medium-sized business are very upbeat about the trading environment for 2019 with 92% expecting sales to increase over the next 12 months, up from 86% last year. The share of medium-sized companies predicting static sales is down from 10% in 2018 to 4% for this year.



Financial environment

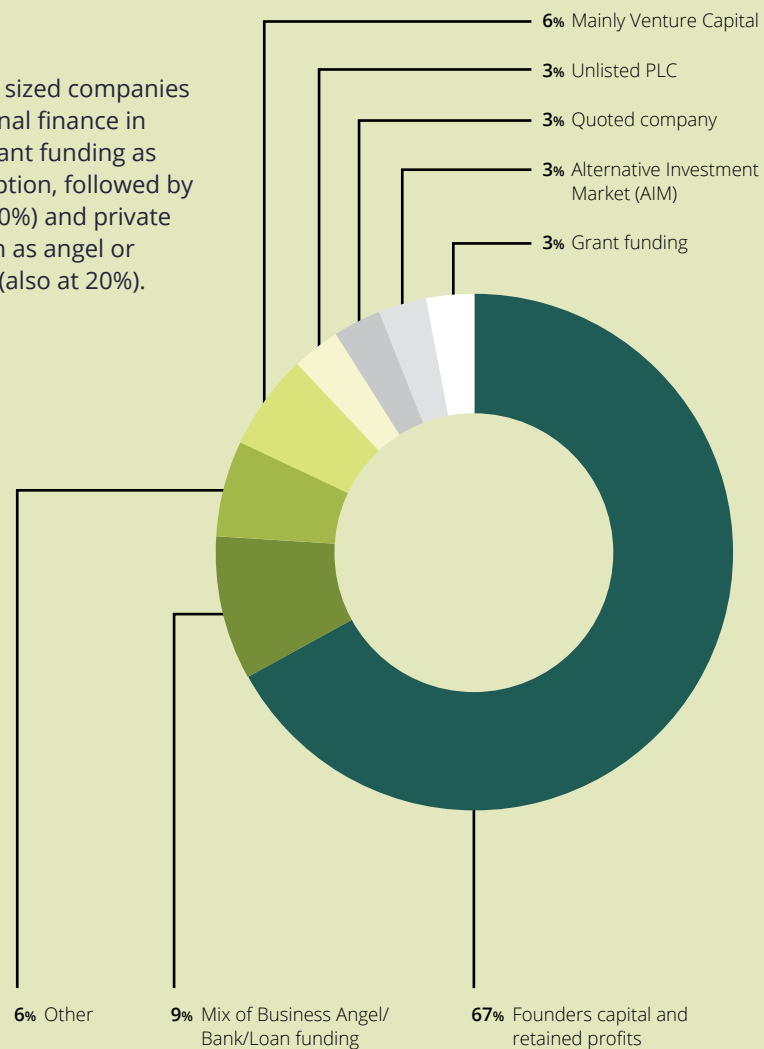
The majority of medium-sized businesses (54%) report turnover between £1-10M and 19% have a turnover of more than £20M (down from 27% last year).



Funding model

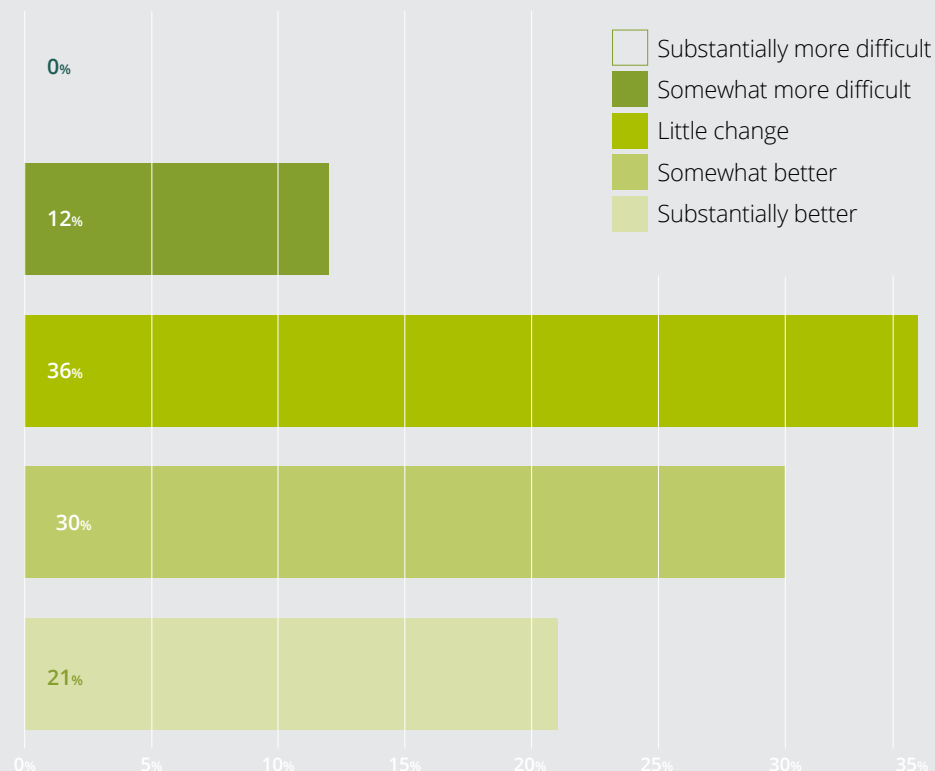
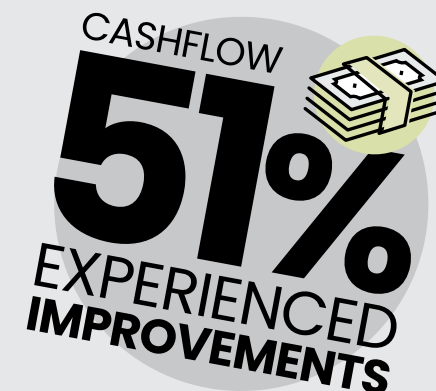
Funding for medium-sized businesses is largely generated from founders capital and retained profits (67%) followed by a mix of business angel, bank and loan funding at 9%, and venture capital at 6%.

27% of medium sized companies needing additional finance in 2019 identify grant funding as the preferred option, followed by bank funding (20%) and private investment such as angel or founder capital (also at 20%).



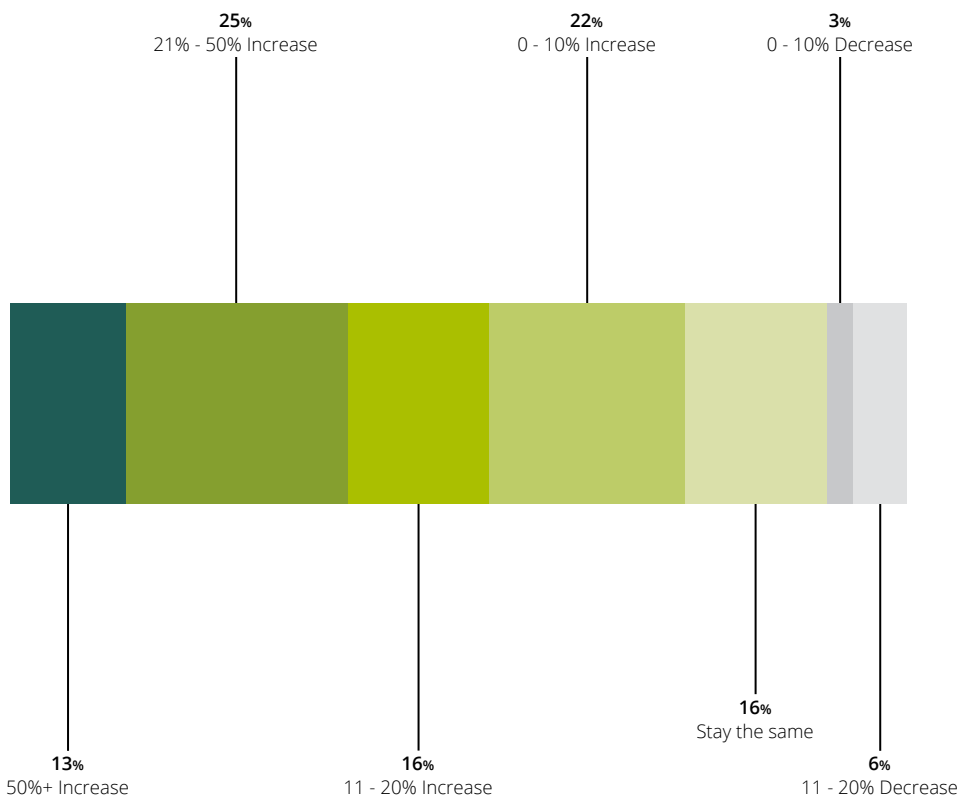
Cashflow compared to last year

Medium-sized businesses reported a similar cashflow situation compared to 2017. 51% reported improvements (same as last year) while 12% reported a worsening position.



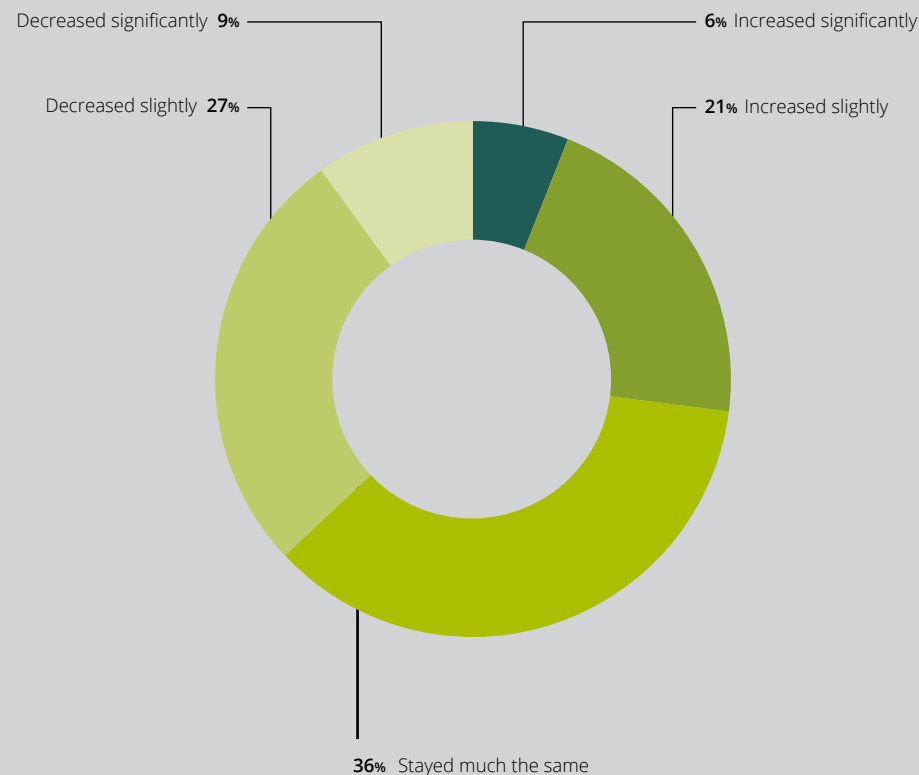
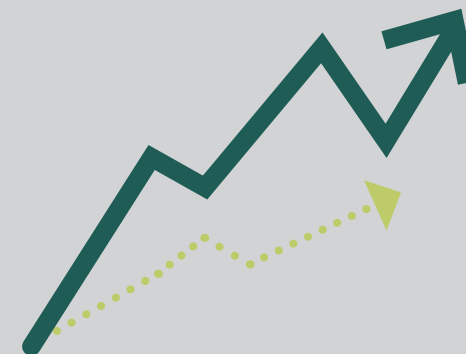
2018 sales levels compared with 2017

In 2018, 75% of medium-sized businesses reported an increase in sales, up from 73% in the previous year. 9% report a decrease in sales, down from 17% in 2017, highlighting that sales performance for medium-sized businesses has improved since last year.



Actuals compared to budget

In 2018, 27% of medium-sized companies reported increases in actuals compared to budget; a further 36% indicated actual sales close to budget with the remaining companies reporting actuals slightly or significantly below budget.



Benchmark 3:

Larger Companies



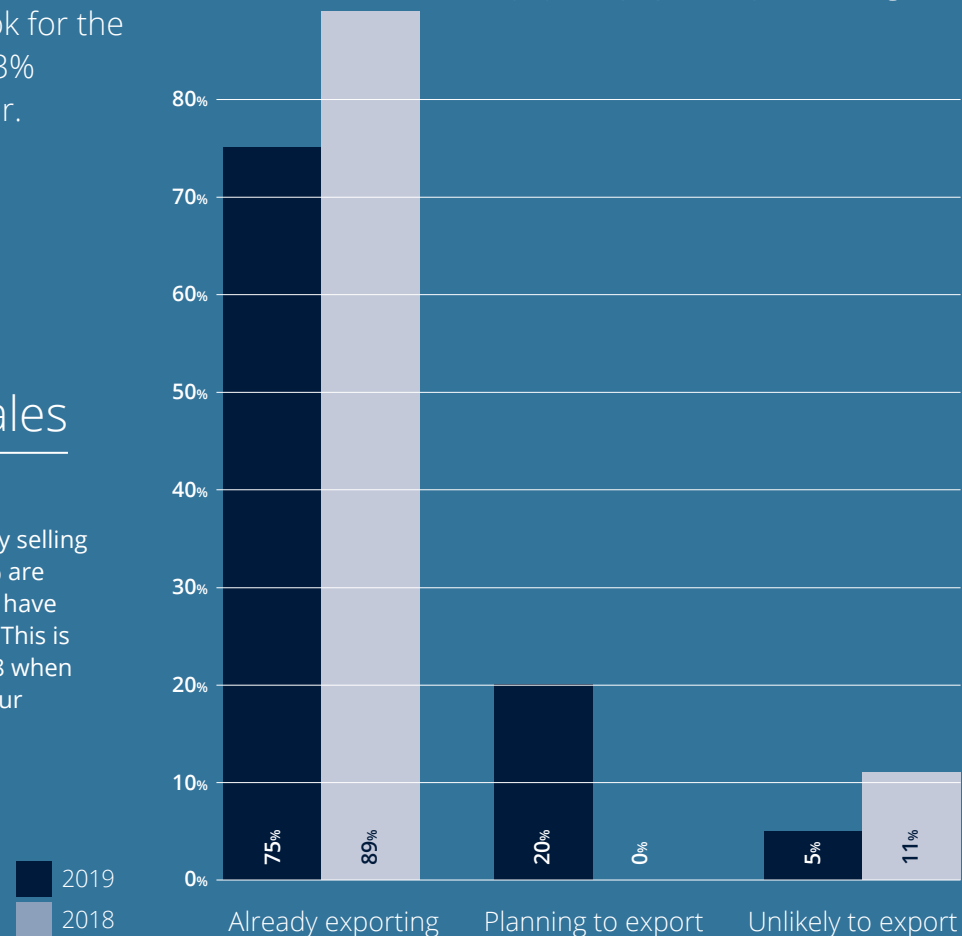
Reflections on 2018

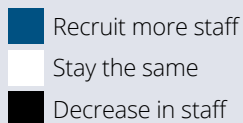
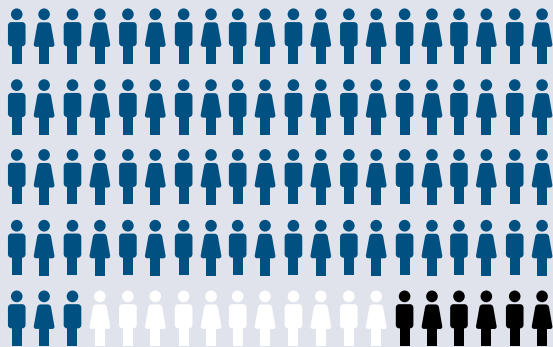
2018 was a very good year for larger companies. 85% reported an increase in sales (up from 78%) and 60% reported that their actual 2018 performance was better than forecast (up from 37%). 85% increased their profit margins, a significant improvement from 35% in 2018. 66% have an optimistic outlook for the next twelve months; which is 3% more than in the previous year.

66% 
HAVE AN **OPTIMISTIC**
OUTLOOK FOR 2018

International sales

Most larger businesses (75%) reported that they are already selling internationally. A further 20% are planning to export, whilst 5% have no intention to sell overseas. This is a decrease compared to 2018 when 89% of larger businesses in our sample exported.





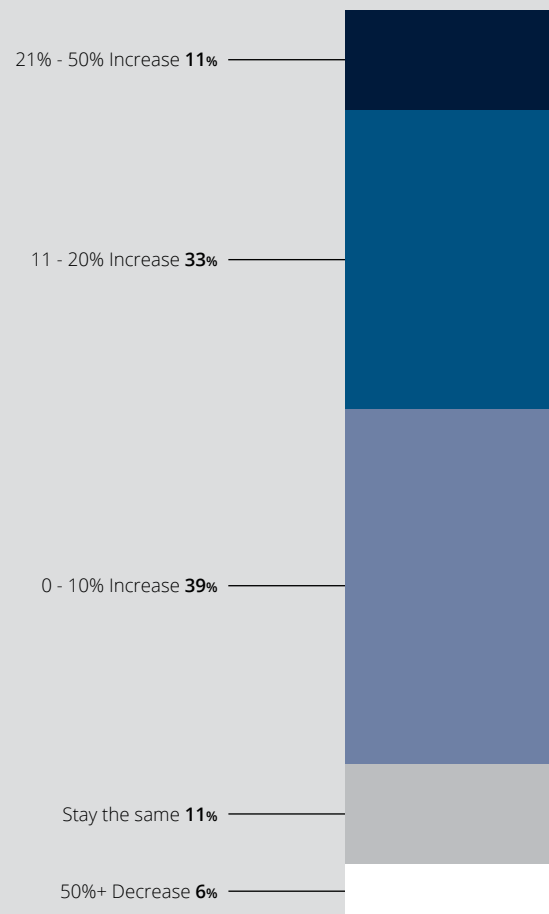
People and skills

With 83% of respondents expecting to increase their employee numbers, the recruitment outlook for larger businesses has again improved (from 73% in 2018), even if more large companies than last year expect a decrease (6% in 2019, 0% in 2018). 39% are planning to take on 50 or more new staff which is up from 23% in 2018.

81% of respondents are likely to recruit university graduates (down from 95% last year) and 59% are likely to take on modern apprentices (considerably down from 90% last year). 33% of large businesses are likely to recruit college graduates, 41% are likely to take on a graduate apprentice and 32% would take on a foundation apprentice.

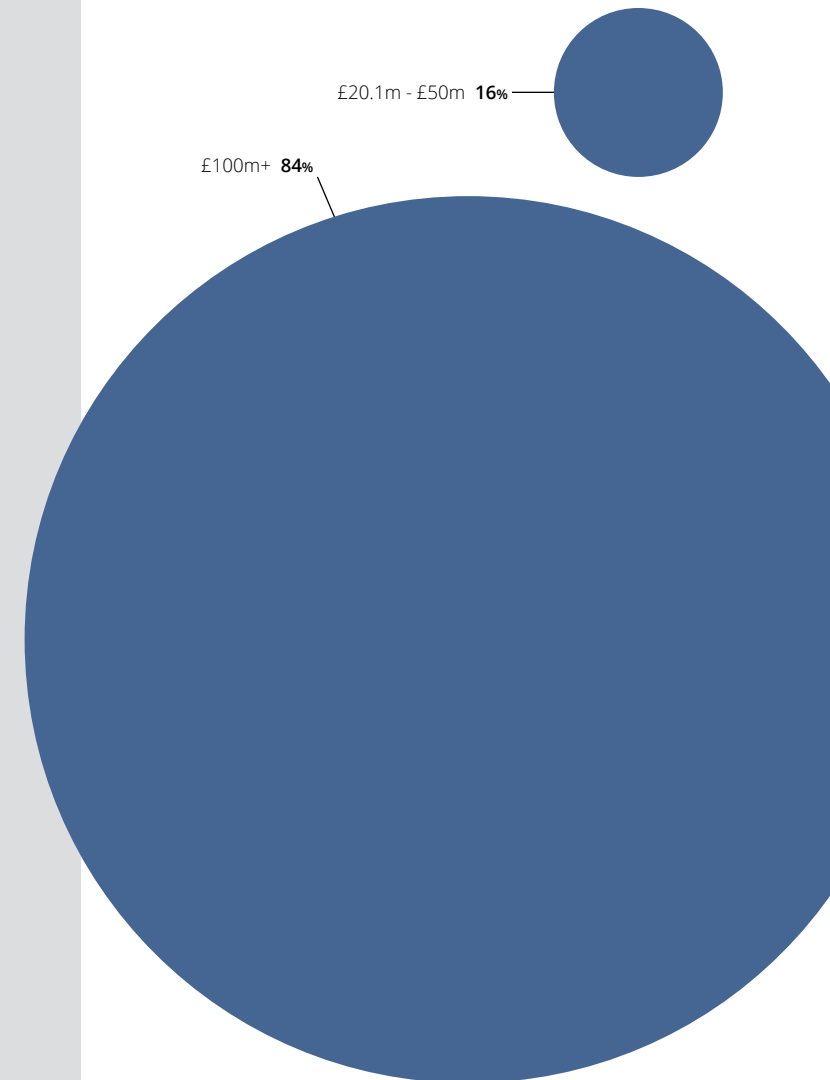
Sales outlook for 2019

83% of larger business expect their sales to increase over the next 12 months. This is slightly up from last year's figure of 81%, though the share of businesses expecting reduced sales has risen from 0% in 2018 to 6% this year.



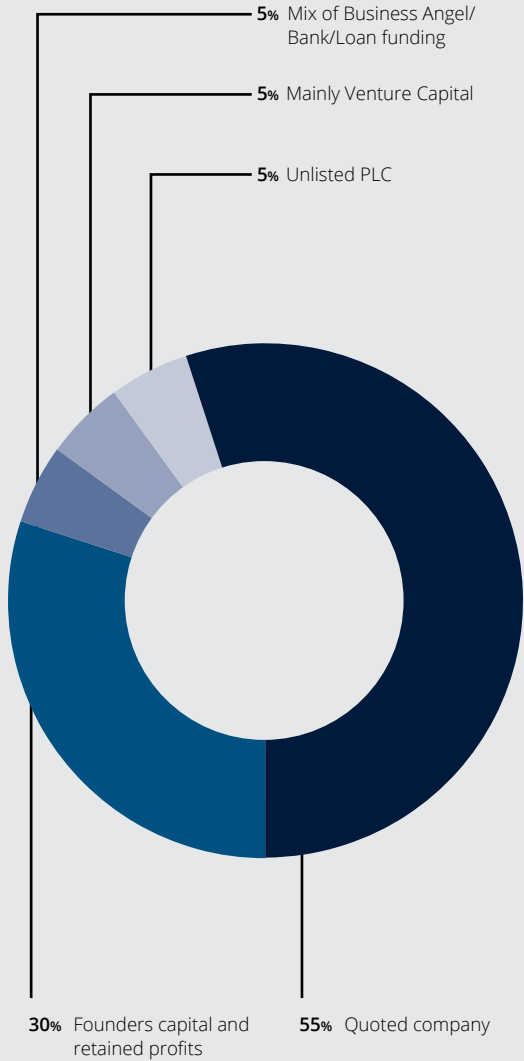
Financial environment

84% of larger businesses have a turnover of more than £100M or more and 16% have a turnover between £20.1M and £50M.



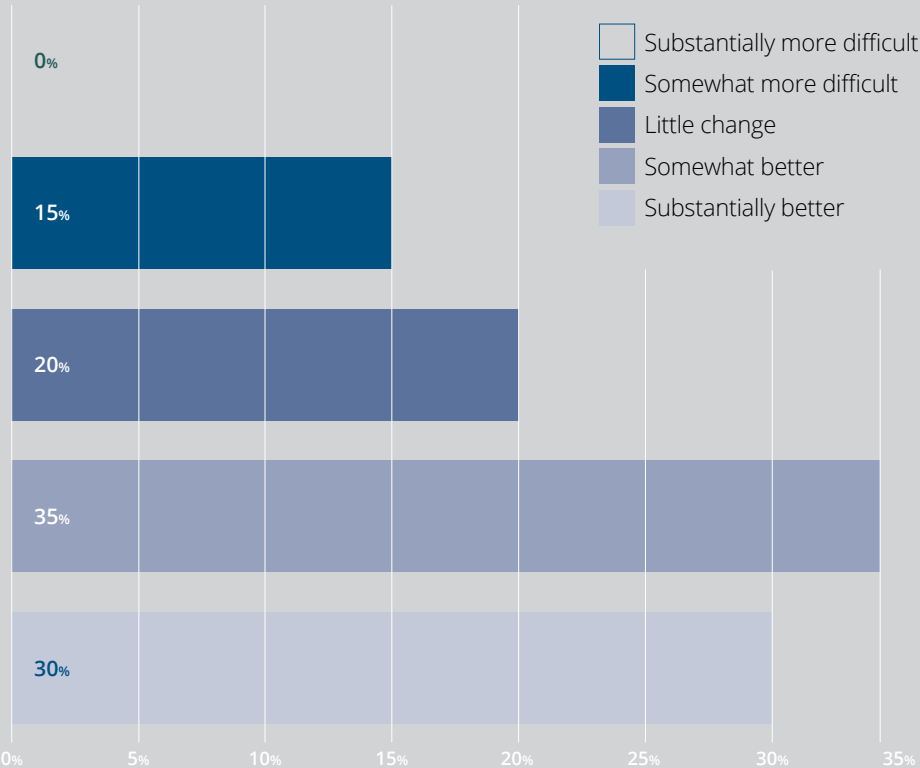
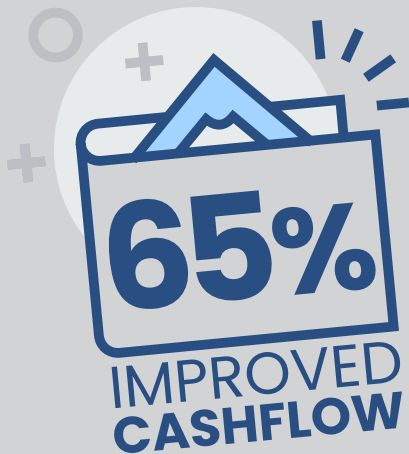
Funding model

Most larger businesses are quoted companies (55%) or are funded through founders capital and retained profits (30%).



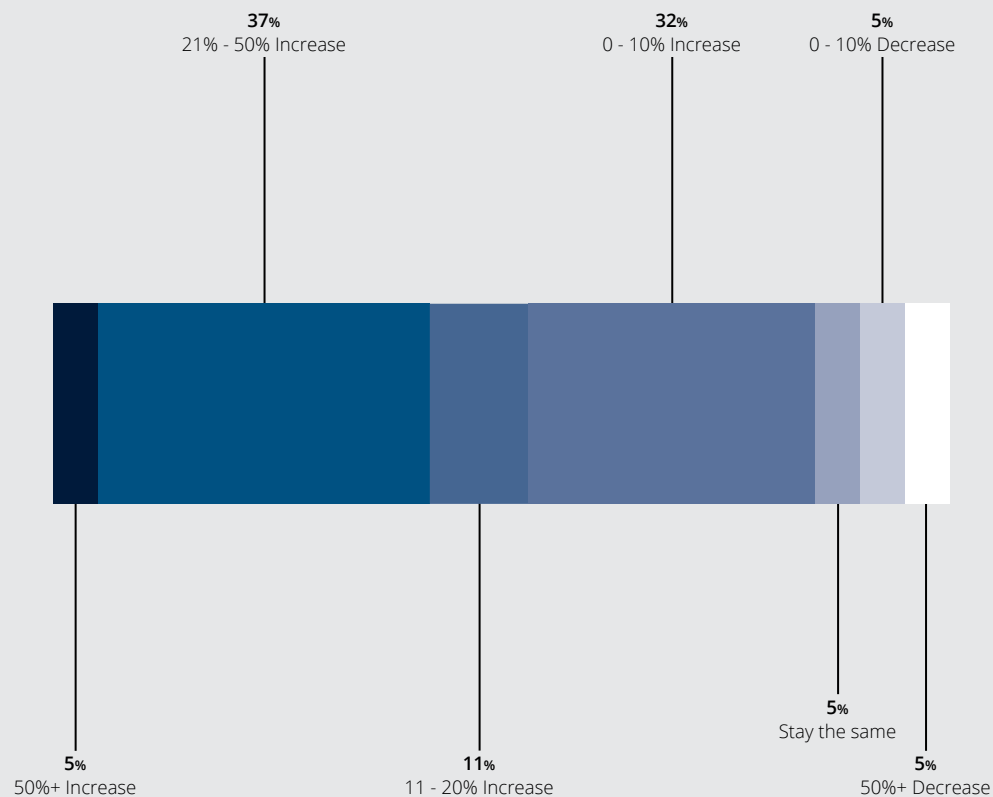
Cashflow compared to last year

The cashflow situation for many larger businesses improved compared to last year with 65% reporting a better situation than last year (up from 34%). 15% of respondents experienced some difficulties (up from 11% in 2017).



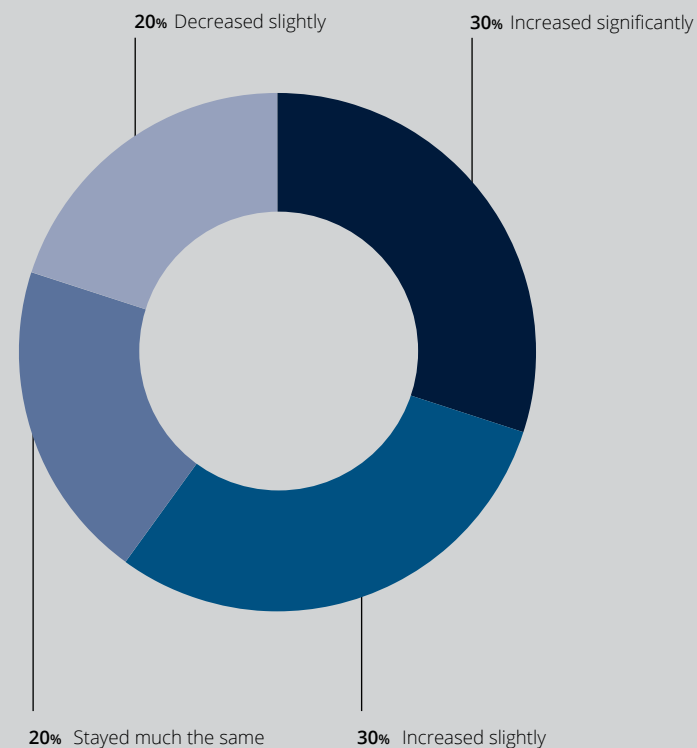
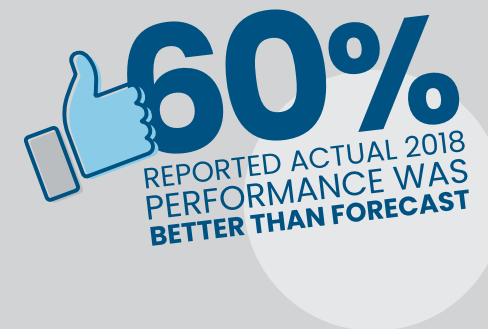
2018 sales levels compared with 2017

Sales in larger businesses have continued to expand, with 85% reporting an increase from 2017, compared to 78% in the previous year. The percentage of larger businesses reporting lower sales was much the same as last year, at 10%.



Actuals compared to budget

In 2018, actuals compared to budget increased for 60% of larger companies, considerably up on the 2017 figure of 37%. However, only 20% of respondents reported actuals close to budget, compared to 44% in 2017.



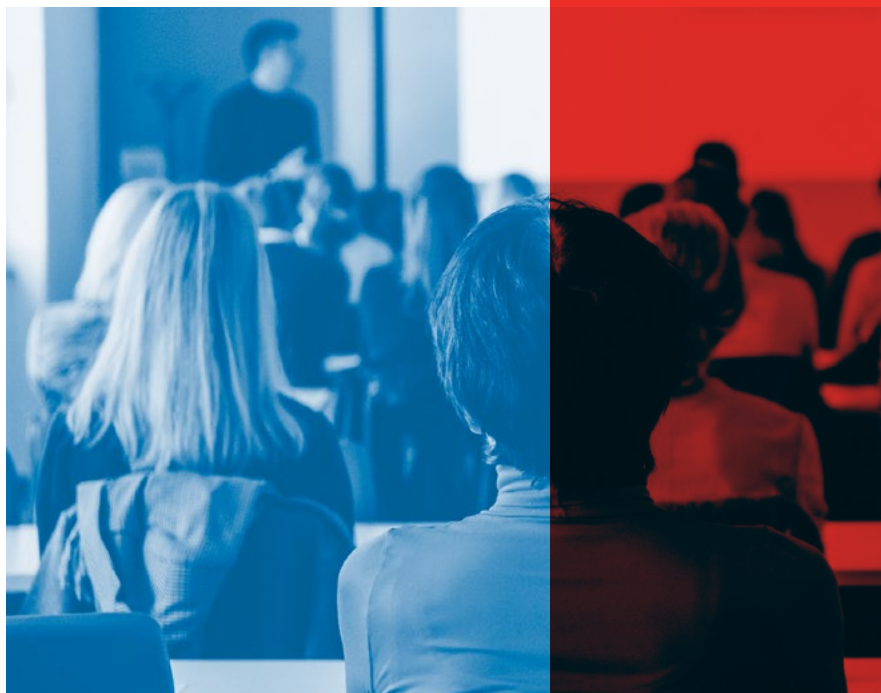
ScotlandIS commentary

The survey results and official statistics analysed for this report paint a more complex picture than in previous years. Official figures show that the growth of the sector has been slowing down with just 1% GVA growth from 2016 to 2017 and no change in the number of digital technologies businesses between 2017 and 2018. These figures are considerably lower than in the last few years and bear further investigation.

At the same time, the share of companies reporting increased sales (up from 68% to 75%) and profit margins (up from 47% to 51%) rose in 2018.

Looking to the future, the vast majority of our survey respondents are optimistic. However, optimism has decreased somewhat from 80% in 2018 to 72% this year and the percentage of respondents linking their future outlook to the political situation has doubled compared to last year (18% in 2019). 41% of this year's survey respondents see the political situation, Brexit in particular, as one of their three top challenges for 2019. This has increased by 24% compared to last year.

We have continued to lobby the Scottish and UK Government and Parliaments to ensure that the needs and concerns of ScotlandIS members and the wider digital technologies sector are recognised by policy makers. As part of our engagement, we gave evidence to the Scottish Affairs Committee of the House of Commons on post-Brexit trade and investment and organised a Brexit discussion event with Scottish Government's Brexit minister Michael Russell MSP. During various meetings with ministers and officials we have discussed the potential impact and opportunities linked to Brexit in terms of immigration and access to skills, access to markets, regulations and EU funding. We will continue this engagement process during 2019 and beyond, taking into account the Brexit support actions suggested by survey respondents, to make sure that our industry continues to thrive.



New opportunities and how we maximise them

Companies report the greatest opportunities for their business over the next 18 months, as being in artificial intelligence and machine learning (46%), followed by data analytics (45%), Internet of Things (32%) and cyber security (29%). This highlights data-driven innovation and cyber security as areas of significant opportunity for our industry. We have therefore decided to enhance the capabilities of ScotlandIS to include cyber security and data through the creation of two new clusters – working closely with Scottish Enterprise as part of this move.

This is part of our evolution, developing ScotlandIS as a membership and cluster management organisation. It enables us to deepen the value our membership provides, creating greater expertise to support our members and represent the Scottish technology sector. The clusters will bring together businesses providing cyber security and data related products and services, facilitating collaboration and the development of new, innovative products and services which could help to open up new markets and opportunities across the globe.

To help deliver this growth, we will appoint three new members of staff to coordinate and develop this programme. A new head of cyber security will build on the work already underway to develop a strong, specialist cyber community in Scotland, while the newly-created head of data role will work to support businesses across Scotland that specialise in data; this will include close collaboration with The Data Lab. A new position to lead operations in the North East has also been created to help build on our presence in Aberdeen and the greater North East area. This is a partnership arrangement with ONE Digital and Entrepreneurship and the person taking on this role will help deliver our shared aspirations to develop the digital economy locally.



Skills development remains a priority

52% IDENTIFY STAFF RECRUITMENT & RETENTION AS A KEY CHALLENGE

The demand for skilled staff remains high in our industry with 81% of survey respondents expecting to take on new team members in 2019 (80% in 2018), despite official statistics showing a decrease in the number of people working in digital technologies businesses in Scotland (-6.1% between 2016 and 2017). Staff recruitment and retention remains a key issue with 52% of this year's survey respondents mentioning it as one of their three top challenges for 2019.

We are involved in or support a variety of initiatives to broaden the talent pool and have run a series of events in 2018 and the first quarter of 2019 to raise awareness of the different options for recruiting and developing staff with digital technologies skills. These include student placements through our ePlacement Scotland¹ programme, the digital skills academy CodeClan,² graduate apprenticeships and college graduates. More of these events are planned for the coming months.

¹ Supported by SFC

² Supported by SDS

University graduates continue to be the main source of new talent for the sector with 70% of survey respondents planning to take on university graduates in 2019. For the first time, we asked companies about their demand for college graduates and 43% of respondents reported they are likely to recruit them. To ensure that both college and university students graduate with the knowledge and skills employers need, ScotlandIS established the Digital Skills Partnership (DSP) in autumn 2017.

DSP brings together industry practitioners with college and university lecturers to work on curricula and course content. Amongst other activities, we are running a series of workshops to update lecturers on current industry practice in the areas of agile development, DevOps, test driven development, data science, machine learning and AI. Lecturers have been matched with "critical friends" in industry to facilitate continuous exchange between them about skills needs and current working practices. As a result, changes to curricula, course programmes and teaching practices are being made.

We continue to be actively involved in the implementation of the Skills Investment Plan for ICT and Digital Technologies and work with a variety of partners to increase the supply of skilled people from schools to workplace learning.

About ScotlandIS

- ScotlandIS is the membership and cluster management organisation for Scotland's digital technologies industry.
- ScotlandIS represents Scotland's digital technologies industries, including software, telecommunications, IT and digital media businesses.
- ScotlandIS members vary from global companies and internationally recognised exporters to very small start-ups and cover a wide range of skills and markets.
- ScotlandIS is at the heart of Scotland's digital economy, shaping, changing and driving it forward. We work with members and partners to support the wider digital transformation of business and society.
- ScotlandIS provides members with connections, relevant market intelligence and a single voice to policy makers. Ensuring a continuing supply of current and future skills is a major area of focus and we facilitate a range of special interest groups and clusters including cyber, data, infrastructure, software engineering and Mobility as a Service.
- ScotlandIS works closely with Scottish Government, Highlands and Islands Enterprise, Scottish Enterprise, Scottish Funding Council and Skills Development Scotland to underline the importance of our industry to the Scottish economy.



Methodology

The Scottish Technology Industry Survey 2019 was conducted between 7 January and 16 February 2019 through an online survey platform. The survey received 160 responses in total, of which 143 have been selected for analysis after discounting duplicates and unusable responses. The respondents include both ScotlandIS members and non-members. Please note that respondents to our survey vary from year to year although many companies respond every year. These variations can impact on the results.

The following official statistics have been used for the overviews on Scotland's digital technologies sector and on digital technologies employment:

- **Number and size of digital technologies businesses**
UK Business Counts, compiled from the Inter Departmental Business Register (IDBR), available through the Nomis service provided by the Office for National Statistics.
- **GVA**
Regional growth value added (income approach) information, provided by the Office for National Statistics, December 2018. Available at: <https://www.ons.gov.uk/economy/grossvalueaddedgva/datasets/regionalgrossvalueaddedincomeapproach>. Based on SIC 2007 divisions 26 and 58-63 as more detailed figures not available.
- **Exports**
Scottish Government: Export Statistics Scotland, January 2019, available at <http://www.gov.scot/Topics/Statistics/Browse/Economy/Exports/ESSPublication/ESSPDF>. Based on SIC 2007 divisions 26 and 58-63 as more detailed figures not available.
- **Employment in digital technologies companies**
Business Register and Employment Survey, available through the Nomis service provided by the Office for National Statistics.
- **Employment in digital technologies roles**
Annual Population Survey, available through the Nomis service provided by the Office for National Statistics.
- **Salary information, future skills demand and skills pipeline information**
Digital Scotland, Scotland's Digital Technologies: Summary Report, June 2017, available at: <https://www.skillsdevelopmentscotland.co.uk/media/43306/scotlands-digital-technologies-summary-report.pdf>.

For the overviews on Scotland's digital technologies sector and on digital technologies employment the following standard industrial classification (SIC) and standard occupational classification (SOC) codes have been used to define digital technologies businesses and jobs:

Digital technologies sector definition by main area of business

SIC Code	Description
18203	Reproduction of computer media
2611	Manufacture of electronic components
2612	Manufacture of loaded electronic boards
262	Manufacture of computers and peripheral equipment
263	Manufacture of communication equipment
264	Manufacture of consumer electronics
268	Manufacture of magnetic and optical media
2731	Manufacture of fibre optic cables
5821	Manufacture of fibre optic cables
5829	Publishing of computer games
611	Wired telecommunications activities
612	Wireless telecommunications activities
613	Satellite telecommunications activities
619	Other telecommunications activities
6201	Computer programming activities
6202	Computer consultancy activities
6203	Computer facilities management activities
6209	Other information technology and computer service activities
6311	Data processing, hosting and related activities
6312	Web portals
6399	Other information service activities not elsewhere classified
9511	Repair of computers and peripheral equipment
9512	Repair of communication equipment

Digital technologies sector definition by occupation

SOC Code	Description
1136	Information Technology and Telecommunications Directors
2133	IT Specialist Managers
2134	IT Project and Programme Managers
2135	IT Business Analysts, Architects and Systems Designers
2136	Programmers and Software Development Professionals
2137	Web Design and Development Professionals
2139	Information Technology and Telecommunications Professionals not elsewhere classified
3131	IT Operations Technicians
3132	IT User Support Technicians
5242	Telecommunications Engineers
5245	IT Engineers

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