bcs The Chartered Institute for IT

60 CELEBRATING SIXTY YEARS 1957 - 2017

DIVERSITY IN IT

2017

SHAPING OUR FUTURE TOGETHER

Foreword

Computing is too important to be left to men...

Ada Lovelace invented the idea of software in 1843, at the age of 28, when working with Charles Babbage on his analytical engine. The first pioneer in computing was a woman and we have had many more female computing pioneers since then: the women at Bletchley Park; Dina St Johnston who set up the UK's first software house in 1959; Dame Stephanie Shirley whose company employed women, mainly working from home in the 1960s, training them to write software including the Concorde black box flight recorder; and Karen Spark Jones, a pioneer in search algorithms whose quote 'Computing is too important to be left to men' is the title of this piece. And that's just in the UK, there are many women tech pioneers across the globe.

I first realised that I needed to get involved in supporting and raising the profile of women in tech during my PhD in software engineering in the 1990s. I found out that talking to men at conferences about my research could be misconstrued which led to me not finding tech conferences an enjoyable experience. Attending a women in science conference some months later I was amazed to find that I could enjoy conferences, meet some great people and have interesting conversations. Being in the majority makes life so much easier. Being in a minority can make something that seems simple difficult.

I set up BCSWomen, the UK's first online network for women in computing in 2001 as a result of my experiences. The idea being to provide a space for women to discuss the topics we cared about in technology with other women. I'm very proud of the fact that BCSWomen still provides a women only space where anything and everything related to technology is discussed. BCSWomen has supported hundreds of women over the last 16 years.

I'm so delighted BCS continues to take a lead in investigating, researching and publishing data around the situation not just for gender but diversity in general in our industry. We need a more diverse industry so that we can create better products and services for everyone. Take the example of the automated point of sale machines in supermarkets. I'm sure we have all experienced the "unexpected item in the bagging area" moment of frustration. Do you think the team that developed those automated POS machines was diverse? Do you think there were people on the team that shopped regularly in a supermarket? I'm guessing not.

Diversity is important for everyone. Only when we have diverse teams, diverse workforces, diverse experiences contributing to creating diverse products and services will we be creating products and services that are fit for all of us. Diversity brings strength.

Technology is such an exciting area to be in. Working in the tech industry we understand the world and the opportunities around us in a way that many others are as yet unable to see without our help. We owe it to everyone else to take a lead in this area, so that they can follow.

You could say that this report paints a dismal picture in terms of diversity and women in tech, we are nowhere near 50/50 male to female in the industry. But I believe that we are at a tipping point of a revolution in technology and also in awareness of the importance of diversity. I've seen massive change over the last few years in attitudes towards diversity in tech. From being asked when setting up BCSWomen in 2001: 'Why are you ghettoising yourself?' I now regularly get asked: 'How can we encourage more women to work in our tech department?'

Things are changing and this report gives us the data we need to measure and evaluate progress highlighting areas of concern and areas of success that we can celebrate along the way.

Let's take our lead from this report and use it to create a a more diverse, more successful tech industry in the UK. We owe it to Ada, Dina, Dame Stephanie, Karen and everyone who has worked hard to make the UK tech industry what it is today.

Dr. Sue Black OBE FBCS

Being in a minority can make something that seems simple difficult

Only when we have diverse teams, diverse workforces, and diverse experiences contributing to diverse products will we be creating products and services that are fit for all

Summary of key findings

Equality and inclusion – key facts

- In 2016 just over one half (51%) of the population (aged 16 and above) were women, 23% were disabled, 45% were aged 50 and above and 12% were of non-white ethnicity.
- By comparison, just 17% of IT specialists were female, 8% were disabled, 21% were from older age groups and 17% were from ethnic minorities.
- Levels of inclusion in IT have improved slightly in recent years with respect to age and ethnicity though the changes mirror those within the labour market as a whole.
- Whilst inclusion levels amongst those in employment tend to be lower for these groups, unemployment rates instead are seen to be higher amongst IT specialists that are disabled, older or from ethnic minority groups.

Equality and inclusion in the workforce

- IT specialists from minority groups are more likely than others to be in non-permanent employment and those in temporary positions are more than twice as likely to be so employed as they could not find permanent work.
- IT specialists from minority groups are generally more likely than others to be self-employed and this was particularly the case for older workers in such positions.
- IT specialists from minority groups are less likely than other workers to be employed in MSMEs or Tech businesses and this is particularly the case for women in IT roles.
- Non-white IT workers were more than twice as likely to be in part-time employment as white counterparts as they were unable to find full-time work.
- IT specialists earn 36% more per week than employees as a whole and those from minority groups are more highly paid still. However, earnings for female IT workers are 11% below that of males and earnings for disabled IT specialists are 13% below those without disabilities.
- Just under three quarters (70%) of all IT specialists have an HE level qualification rising to nine in ten (87%) of those from ethnic minorities. Amongst those with disabilities the proportion is much lower at just six in ten (59%).
- Whilst 17% of IT specialists hold an IT degree the figure amongst minority groups is lower (13%) and amongst female IT specialists in particular just 8% have a degree in an IT discipline.
- The overall match between the level of skills held/needed by IT specialists is lower than the workplace norm (63% versus 68%) and is lower still amongst minority workers in IT. This is a particular issue amongst older, disabled and, to a lesser degree, female IT specialists of which one fifth or more are thought to be under educated/skilled in their job.
- Overall, IT specialists from minority groups are less likely to find work as existing staff than others in IT positions.

CONTENTS

bcs The Chartered Institute for IT

1 Background

In 2010 The Equality Act (EA2010) was introduced to provide 'a modern, single legal framework with clear, streamlined law to more effectively tackle disadvantage and discrimination' in Britain, according to the Equality and Human Rights Commission.

The act legislates against inequality in all aspects of employment from recruitment and contractual negotiations, working practices, management/assessment, pay and benefits, training and development through to termination of employment, and in each of these areas the Act seeks to equal treatment irrespective of a person's age, (dis)ability (physical or mental), gender, marital status, maternal status, race, religion or sexual orientation.

The Equality Act is now nearly seven years old and nearly 50 years have passed since the introduction of various, now integrated, 'core' pieces of equality focused legislation (e.g. the Equal Pay Act), the hope would be that society and employers in particular have had sufficient time to digest and accommodate the associated requirements, and that workers (current/future) in Britain enjoy equality of opportunity in the labour market whatever their personal characteristics (legislation in Northern Ireland is primarily set out in Section 75 of the Northern Ireland Act 1998).

In this report, we seek to test this hypothesis with particular focus upon the IT labour market and associated professions. More specifically, using data from the ONS Labour Force Survey we have sought to provide an understanding of the levels of equality and inclusion facing four key groups identified within the Equality Act namely women, the disabled, those from ethnic minority (i.e. non-white) groups and older workers (in this instance encompassing those aged 50 and above).

The purpose of this analysis is three-fold:

1. To provide a definitive source of information concerning the levels of 'minority' representation amongst the IT professions for all individuals/organisations with an interest in this area.

2. To identify and explore the extent to which the market is failing those from minority groups as demonstrated by below average levels of representation/compensation amongst these groups when compared with others working in IT.

3. To highlight some of the potential benefits of working in IT that may be enjoyed by anyone with an interest or aptitude for such work be they from minority groups or otherwise.

Equality for those working in IT is legislated by the 2010 Equality Act

2 The UK - a nation of minorities

The Equality Act seeks to promote equality amongst all individuals irrespective of their socio-economic characteristics. Hence, it is interesting to note from the outset of this report that total 'membership' for four 'key' groups of people in the UK often associated with being 'minorities' with respect to representation in the workforce (women, disabled, ethnic minority and older people) actually encompass around 80% of the entire population (aged 16 and above) living in the UK.

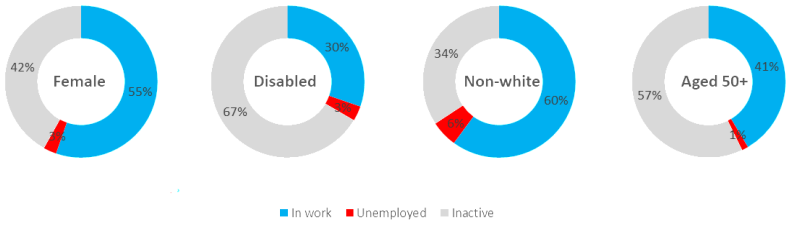
This is largely down to the high proportion of UK residents that are either women (51% of the total) or aged 50 and above (45%) though 23% of the population in 2016 could be classed as disabled according to EA2010 definitions and 12% were of non-white ethnic origin.

Four in five people are women, disabled, older or non-white

2.1 Key groups and labour market participation

The overall level of labour market participation varies substantially for these four groups and whilst 60% of individuals from ethnic minorities were in work in 2016, the figures were much lower for other groups – 55% for women, 41% for individuals aged 50 or over and just 30% for disabled people.

Figure 1: Labour market participation in the UK, 2016



Source: Analysis of ONS Quarterly Labour Force Survey by BCS

The other striking observations from these charts are the extremely high proportion of disabled people that are inactive (67%) and the proportion of non-white people that are unemployed (6%) - not to be confused with unemployment rates, which are documented later in this report.

Only 30% of disabled people were in work in 2016

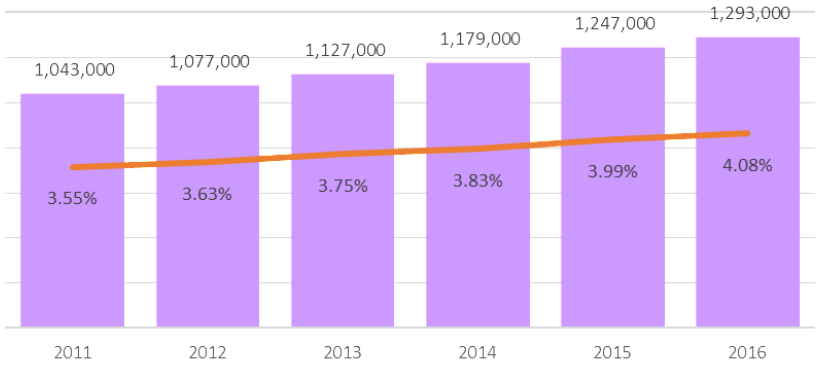
3 IT labour market overview

3.1 Workforce trends

In 2016 there were an estimated 1,293,000 people in the UK labour market working as IT specialists and this group accounted for 4.1% of the entire UK workforce at that time – up from 4.0% in the previous year. Indeed, the proportion of the UK workforce in IT specialist positions has increased significantly during each of the past five years as demand for workers with IT skills has continually outstripped that for workers as a whole and between 2015-16 employment growth for IT positions (4.0%) was four times that observed within the wider workforce.

IT employment is growing four times faster than average

Figure 2: IT specialists in the UK workforce



Source: Analysis of ONS Quarterly Labour Force Survey by BCS

3.2 Growth implications

IT is a core activity for all businesses and the number of positions for IT specialists has grown at a rate well above the norm. Consequently, it is perhaps unsurprising that the IT sector has been dogged by reports of related skills shortages (i.e. a difficulty in finding applicants for IT positions with the required skills, qualifications or experience).

To illustrate this, in 2016, results from the ONS Ecommerce Survey suggested that amongst UK enterprises that had sought to recruit staff with IT specialist skills, 34% had experienced difficulty filling some or all of these positions.

With such a high incidence of skills shortages within the IT labour market it could be expected that employers would seek to maximise their potential of attracting candidates to IT positions by 'spreading their recruitment net' as widely as possible.

However, the following sections of the report show that levels of inclusion within the IT professions are generally poor and, in the case of female workers in particular – woefully low despite the fact that IT positions can be associated with generally favourable working arrangements and benefits, not least above average levels of remuneration for those choosing a career in this field.

In 2016, over one-third of IT recruiters had hard-to-fill vacancies

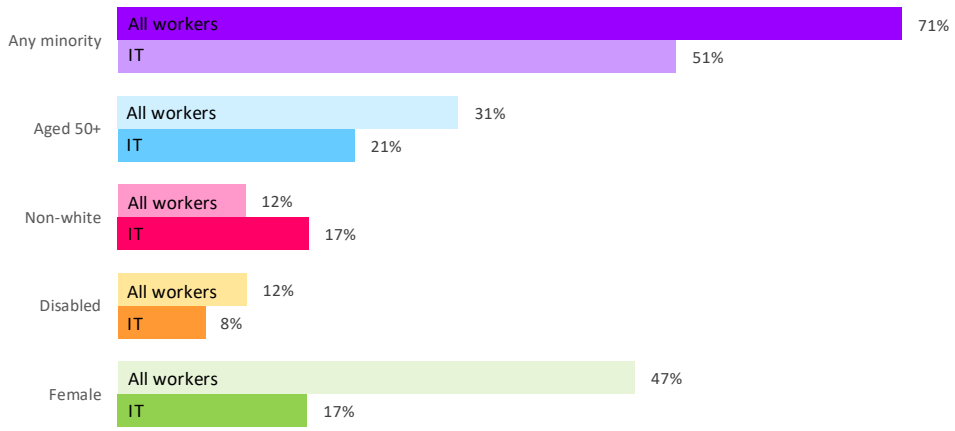
4 Inclusion and IT

4.1 Overview

Comparison of the levels of inclusion amongst IT specialists and the wider UK workforce during 2016 reveals IT specialist were under-represented with respect to disabled people, older people and female workers (with 'deficits of 4, 10 and 30 percentage points respectively). In fact, only in the case of those from ethnic minority workers was representation higher amongst IT specialists than for the workforce as a whole (5 percentage points).

There are below average levels of inclusion in IT for women, disabled people and older workers

Figure 3: Workforce representation by key group, 2016

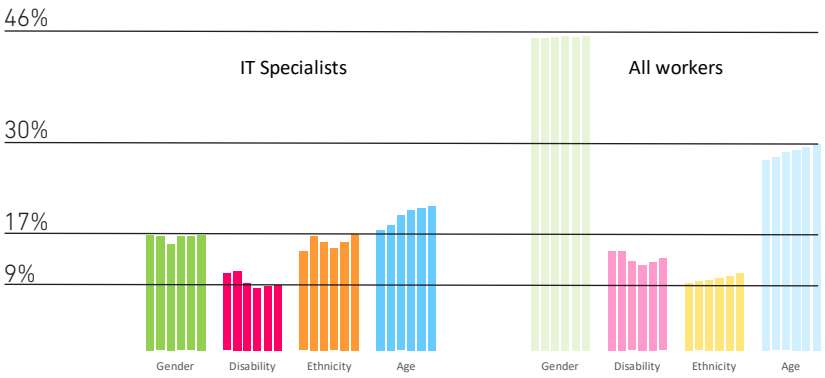


Source: Analysis of ONS Quarterly Labour Force Survey by BCS

These inclusion levels for IT jobs, like those within the wider labour market have changed little in recent years, and since 2011 only in the case of older workers and ethnic minorities has there been an increase in the level of representation (3 and 2 percentage points respectively). Moreover, these changes are largely a reflection of those observed for the workforce as a whole where increases of 4 and 2 percentage points were observed over the 2011-2016 period. (For the purposes of the trend analysis presented here, disability is defined according to the DDA (Disability Discrimination Act) 1995 which preceded that set out in the Equality Act of 2010. This procedure has been taken due to the unavailability of Equality Act based figures within the ONS Labour Force Survey prior to 2015. The effects upon the trends shown are thought to minimal and comparison figures for representation in the IT professions for 2016 are 8% and 10% respectively under the Equality Act/ DDA definitions.

There has been little change in the overall levels of inclusion in IT over the past five years

Figure 4: Trends in workforce representation, 2011-16



Source: Analysis of ONS Quarterly Labour Force Survey by BCS

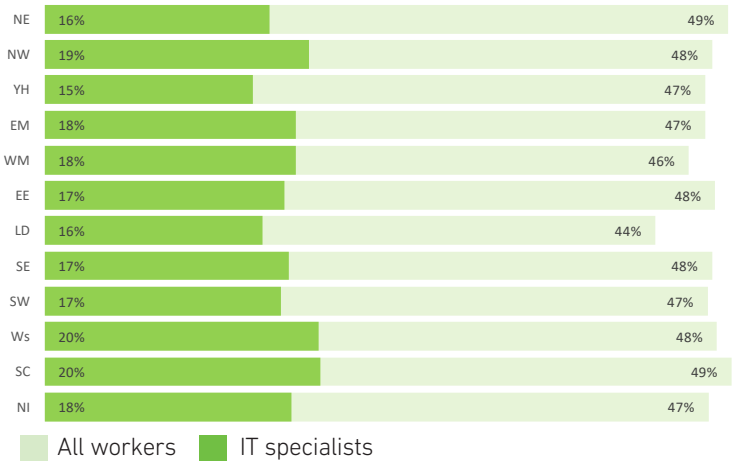
4.2 Inclusion across the UK

Gender

Over the 2014-16 period the proportion of IT specialists that were female varied from a low of just 15% in the Yorkshire/Humberside region to a high of 20% in Scotland and Wales (years combined due to small sample). In all UK nations/regions, the level of representation for women in the IT profession was well below the norm for all workers and this gap was largest in the North East, Yorkshire/Humberside, the East of England (over 30 percentage points in each case).

Just 15% of IT specialists working in Yorkshire/ Humberside are female

Figure 5: Representation of women in IT, by nation/region (2014-16)



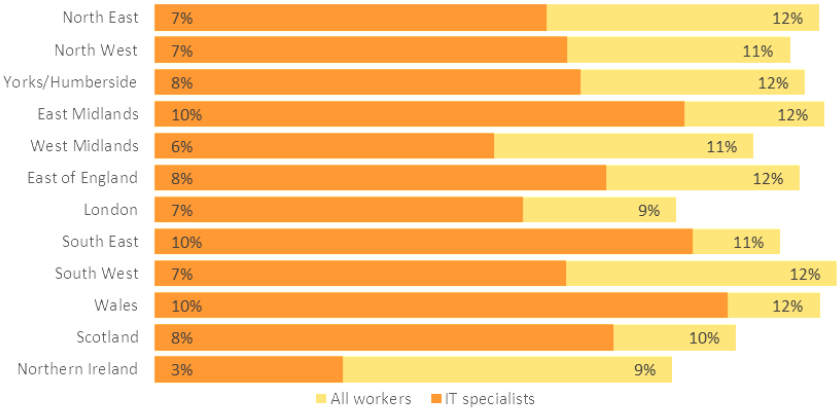
Source: Analysis of ONS Quarterly Labour Force Survey by BCS

Disability

Again, the levels of inclusion for disabled people in IT roles varies considerably by region – from just 3% in the case of Northern Ireland to 10% in Wales, the South East and the East Midlands and, in all regions, the level of representation for disabled people in IT jobs was again below that for the workforce as a whole.

Only 3% of IT specialists in Northern Ireland are disabled

Figure 6: Representation of disabled workers in IT, by nation/region (2014-16)



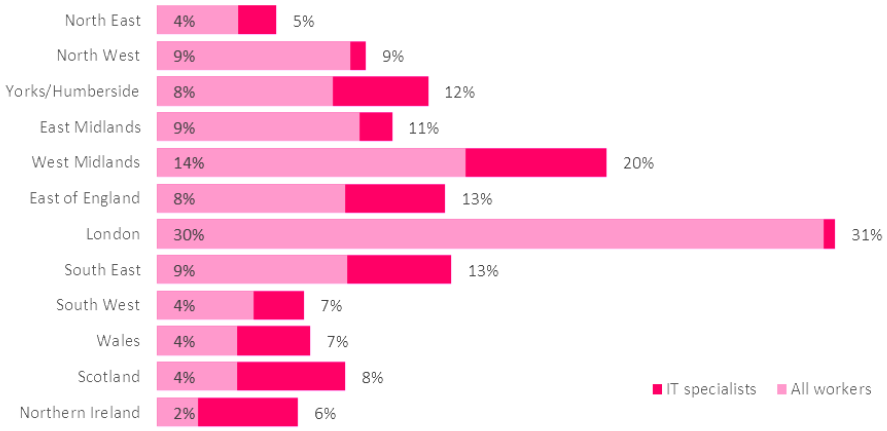
Source: Analysis of ONS Quarterly Labour Force Survey by BCS

Ethnicity

Over the 2014-16 period the proportion of IT specialists from non-white groups was higher than that for all workers in each of the 12 UK nations/regions and in London just under one third (31%) of IT specialists were of a non-white background – a stark comparison with the North East where a figure of just 5% was observed.

Almost a third of IT specialists in London are from minority ethnic groups

Figure 7: Representation of non-white workers in IT, by nation/region (2014-16)



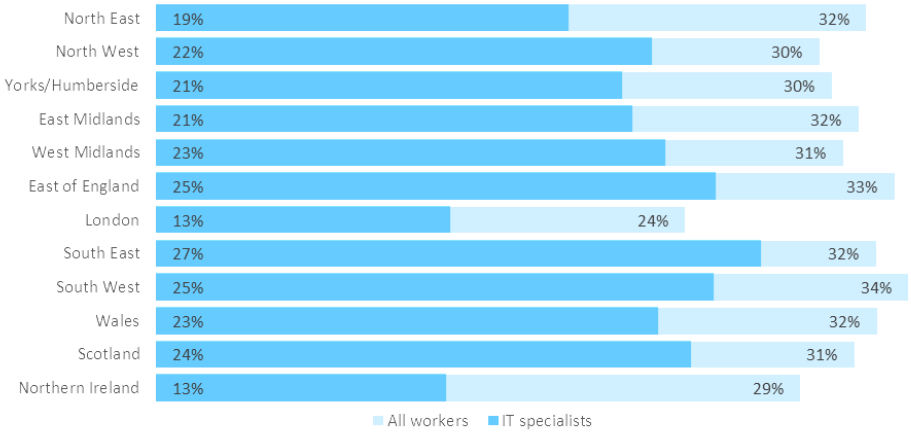
Source: Analysis of ONS Quarterly Labour Force Survey by BCS

Age

Despite being the region with the highest levels of ethnic inclusion amongst IT specialists, London, along with Northern Ireland is also the area with the lowest proportion of workers in IT positions aged 50 and above (13% in each case). Representation of older workers was also lowest in London when considering the workforce as a whole (24%) and, as such, the disparity between inclusion levels for older workers in IT and other occupations, though below the norm in the capital, is not as severe as in many other parts of the UK, notably: the North East and Northern Ireland where the differences in representation levels for IT and all workers were 16 and 13 percentage points respectively.

Older workers are poorly represented in London, whether working in IT or other jobs

Figure 8: Representation of older workers in IT, by nation/region (2014-16)



Source: Analysis of ONS Quarterly Labour Force Survey by BCS

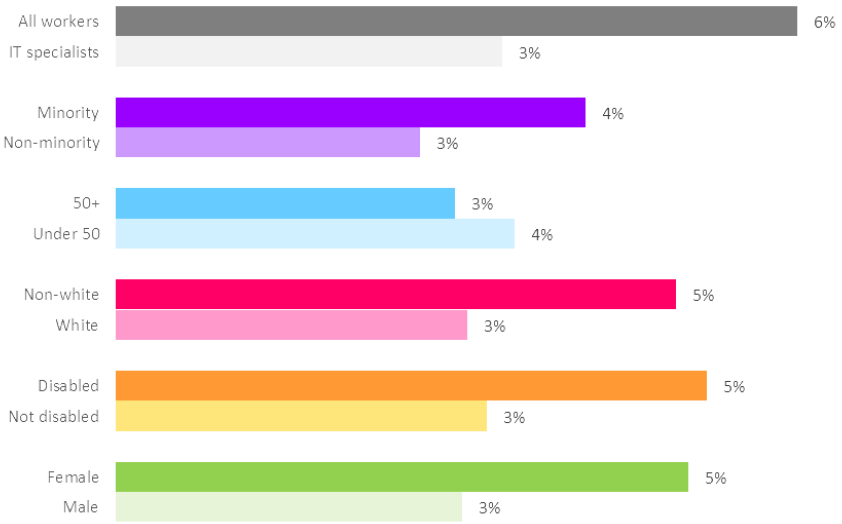
5 Inclusion by nature of employment

5.1 Permanency of employment

In general IT specialists are less likely to be in non-permanent employment than those within the workforce as a whole (with relative proportions of 3% and 6% respectively) and this is also the case for those within each of the minority groups analysed within this report. A more detailed analysis of data for IT specialists shows however that non-permanent employment is more common for female as opposed to male workers, disabled as opposed to non-disabled and non-white versus white IT specialists.

Overall, IT specialists from minority groups are more likely to be forced into non-permanent jobs

Figure 9: IT inclusion and the incidence of non-permanent employment, 2016

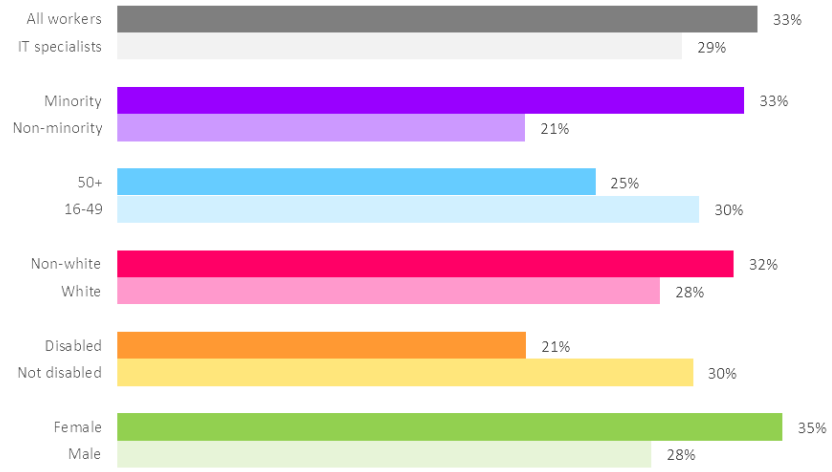


Source: Analysis of ONS Quarterly Labour Force Survey by BCS

Not only are IT specialists from minority groups more likely to be in non-permanent positions than other workers, but they are also more likely to be forced into this kind of work as they are unable to find a permanent job (comparison figures of 33% and 21% respectively - this is a three year average, treat with caution as low bases).

This finding is not common to all minority groups however, and whilst female IT specialists and those from non-white groups are more likely to be unable to find permanent work than their male/ white counterparts, the reverse appears true for the disabled / those aged 50 and above.

Figure 10: IT specialists in non-permanent posts unable to find permanent jobs, 2014-16



Source: Analysis of ONS Quarterly Labour Force Survey by BCS

5.2 Inclusion by IT occupation

The issue of inclusion amongst IT specialists varies dramatically according to the nature of occupation in question, though in absolute terms, the levels of inclusion for disabled people are lower than other groups in all areas of IT work bar IT engineering. That said, the disparity between the level of inclusion in the IT professions and the level observed for all occupations is higher for women in all IT occupational groups.

Inclusion levels are worse for disabled people in all IT specialisms bar IT engineers

Figure 11: Inclusion by IT occupation, 2016

	Female	DISEA	Non-white	Older	Any minority
IT Directors	10%	8%	14%	32%	52%
Specialist tech Managers	20%	6%	10%	25%	48%
Tech Project & Programme Managers	25%	9%	19%	31%	59%
Business Analysts, Architects & System Designers	18%	7%	18%	25%	54%
Programmers & Software Development Professionals	12%	7%	24%	15%	48%
Web Design & Development Professionals	22%	10%	10%	11%	42%
Other IT specialists	17%	7%	21%	23%	55%
IT Operations Technicians	24%	14%	14%	17%	54%
IT User Support Technicians	18%	9%	15%	20%	47%
IT Engineers	9%	12%	11%	21%	47%
All IT specialists	17%	8%	17%	21%	51%
Total	47%	12%	12%	31%	71%

Lowest — Highest

Source: Analysis of ONS Quarterly Labour Force Survey by BCS

However, inclusion is not an issue solely in IT. As illustrated in the subsequent table, the situation is often actually worse in other well recognised professions – notably amongst the police and civil engineers. More specifically in 2016 it was observed that there was a lower proportion of females working as civil engineers than IT specialists, a lower proportion of disabled people working as doctors and solicitors, a lower proportion of police officers aged 50 or over and lower proportions of non-white workers employed as civil engineers, police officers, nurses, teachers and solicitors.

Inclusion levels in other recognised professions are often worse than in IT

Figure 12: Inclusion by selected professions, 2016

	Female	DISEA	Non-white	Older	Any minority
Civil engineers	11%	8%	12%	29%	48%
Police Officers	26%	9%	5%	11%	44%
Doctors	44%	5%	37%	26%	80%
Nurses	88%	12%	17%	35%	95%
Teachers (secondary)	60%	9%	9%	27%	73%
Solicitors	45%	6%	10%	28%	70%
Accountants	43%	9%	18%	30%	75%
All IT specialists	17%	8%	17%	21%	51%
All workers	47%	12%	12%	31%	71%

Lowest — Highest

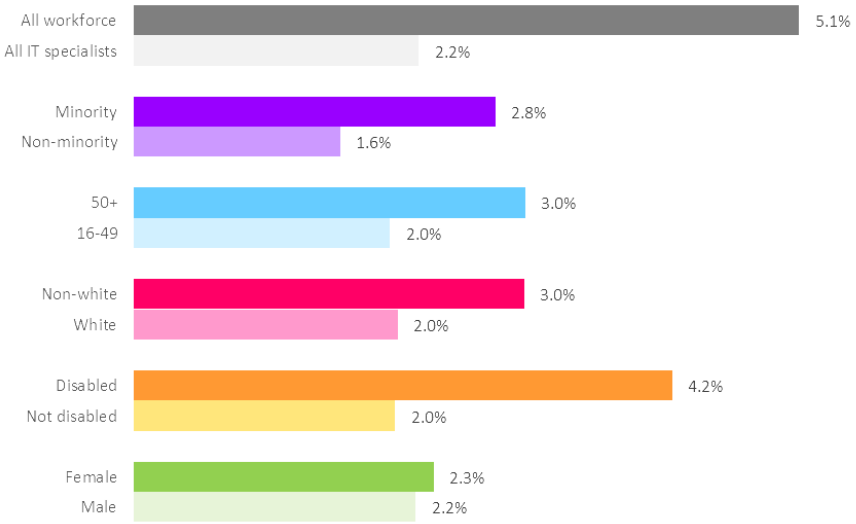
Source: Analysis of ONS Quarterly Labour Force Survey by BCS

5.3 Inclusion and unemployment

Sadly, whilst the minority groups analysed in this report tend to exhibit lower levels of inclusion within the IT workforce, they are more likely to be unemployed, and with the exception of female IT specialists, each group is associated with an unemployment rate higher than that for IT specialists as a whole or of their peers of 'non-minority status'. This is particularly apparent for disabled IT specialists who were associated with an unemployment rate of 4.2% over the past two years compared with a figure of 2.0% of IT specialists not so classified.

The unemployment rate for IT specialists in minority groups is higher than the norm

Figure 13: IT inclusion and associated unemployment rates for IT specialists, (2015-16)



Source: Analysis of ONS Quarterly Labour Force Survey by BCS

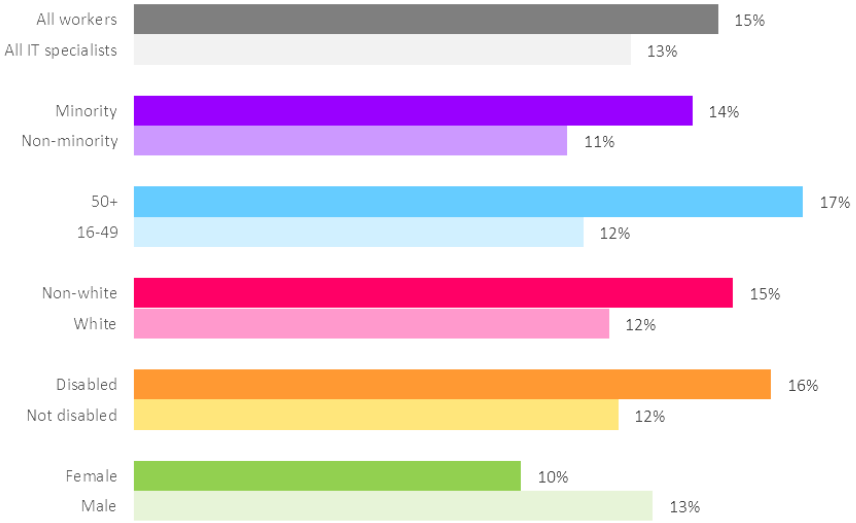
6 Employer characteristics

6.1 Self-employment

IT specialists are slightly less likely than other workers to be self-employed and in 2016 approximately 13% of IT specialists were working in this manner compared with 15% of the workforce in total. The proportion of IT specialists from minority groups that were self-employed was slightly higher than that for non-minorities (14% versus 11%) and this was apparent in all 'minority' groups bar female workers who were also associated with the lowest incidence of self-employment (10%).

IT specialists from minority groups are more likely to be self-employed

Figure 14: IT inclusion and the incidence of self-employment, 2016



Source: Analysis of ONS Quarterly Labour Force Survey by BCS

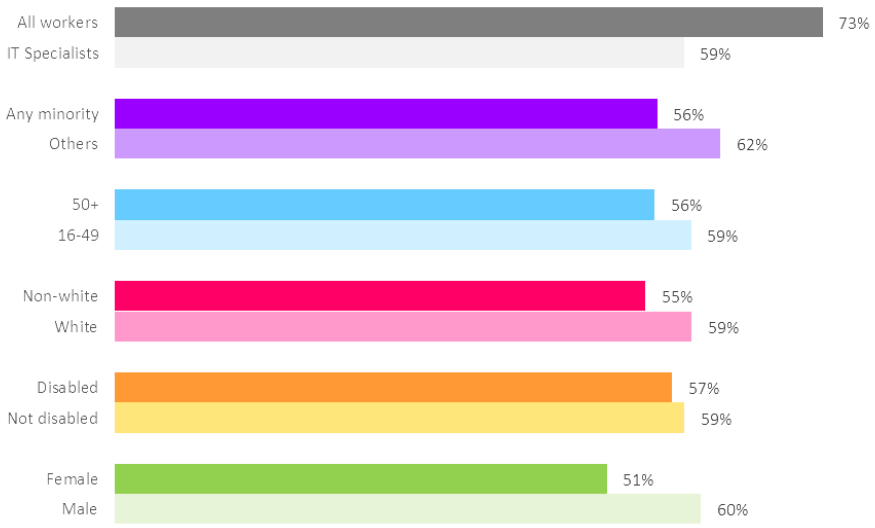
The difference in the incidence of self-employment was most pronounced when considering the age of IT specialists with 17% of IT specialists aged 50 and above working on contract compared with 12% of younger workers in such positions. However, the overall proportion of older workers in the workforce as a whole who were working in this manner was still higher, at 22% of the total.

6.2 Employer size

Amongst IT specialists working as employees, just under six in ten (59%) were found to be working in MSMEs (micro, small, medium-sized establishments) – a figure well below that for employees as a whole in the UK (73%). IT specialists from each of the four minority groups were also found less likely to be working in smaller organisations (MSMEs) and the proportion for female IT specialists in particular was the lowest at just 51% of the total

IT specialists, and those from minority groups are less likely than others to work in MSMEs

Figure 15: IT inclusion and incidence of working in MSMEs, 2016



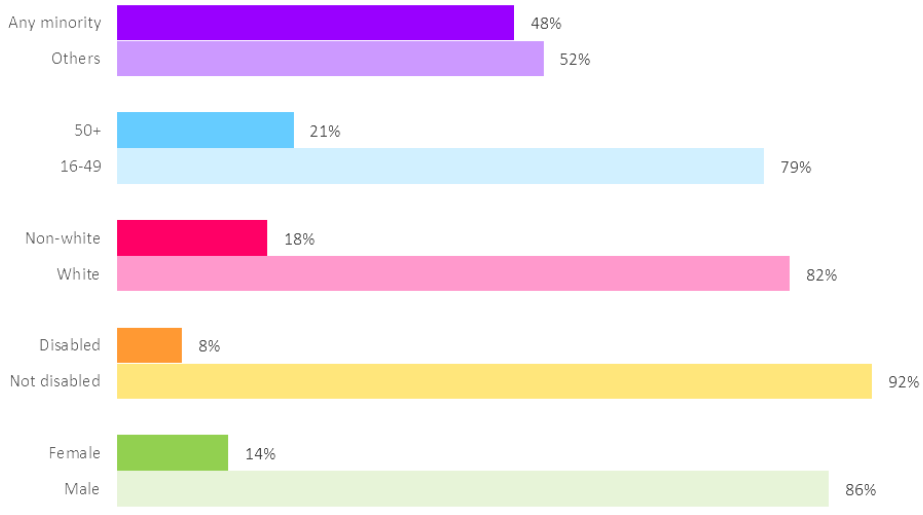
Source: Analysis of ONS Quarterly Labour Force Survey by BCS

6.3 Industry of employment

Just under one half (47%) of IT specialists were found to be working in IT businesses in 2016. The proportion of those from minority groups working in this type of firm was much the same at 45%. There was also little variation by the type of minority group analysed – the one exception to this finding being the relatively low percentage of female IT specialists (37%) working in IT firms compared with their male counterparts. As a result, inclusion levels for female IT specialists in the tech industry were even lower than the norm at just 14% compared with 17% across the economy as a whole).

Female IT specialists are much less likely to work in IT businesses

Figure 16: Representation of IT specialists working in the tech industries, 2016



Source: Analysis of ONS Quarterly Labour Force Survey by BCS

Looking outside of the tech industries it is apparent that inclusion levels for IT specialists are generally worst within the manufacturing sector where below average figures can be observed for females, non-white workers and minority workers as a whole. For IT specialists with disabilities -

agriculture/utilities firms exhibit the lowest inclusion levels (5%) whilst for those aged 50 and above it is the distribution, hotels and restaurants where just 17% of IT specialists are of this age group.

Figure 17: IT inclusion by non-tech industry (2014-16)

	Female	Disabled	Non-white	Older	Any minority
Agriculture/utilities	26%	5%	22%	25%	61%
Manufacturing	13%	8%	11%	25%	48%
Construction	18%	7%	14%	22%	50%
Distribution, hotels and restaurants	20%	10%	18%	17%	50%
Transport and communication	18%	9%	13%	20%	49%
Banking and finance	18%	6%	16%	19%	49%
Public admin, education and health	29%	10%	13%	26%	59%
Other services	27%	7%	28%	20%	59%
All non-tech industries	**21%**	**8%**	**15%**	**22%**	**52%**
IT industries	13%	8%	17%	21%	48%
All workers in non-tech industries	48%	11%	11%	31%	71%

Source: Analysis of ONS Quarterly Labour Force Survey by BCS

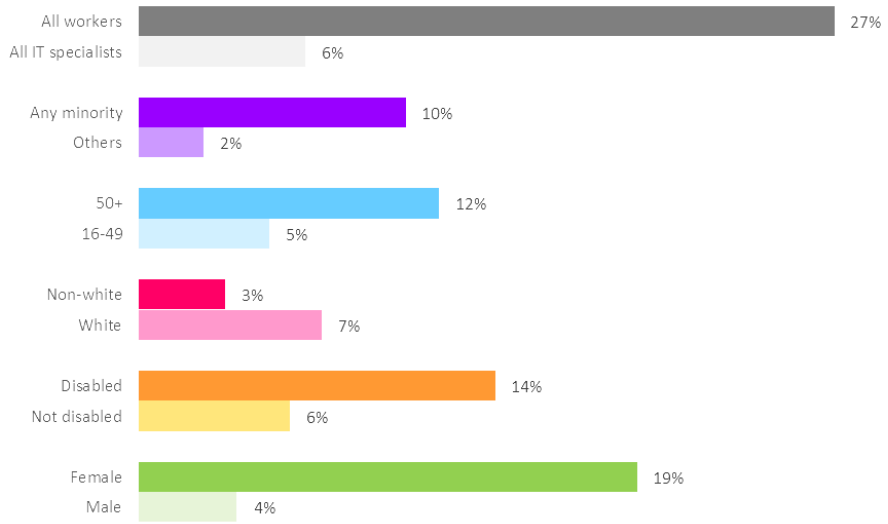
7 Working hours and benefits

7.1 Full and part-time working

Just 6% of IT specialists were working part-time in 2016 compared with 27% of all UK workers, though the incidence of part-time working was higher amongst IT specialists from each of the minority groups than their 'non-minority' counterparts in all cases bar those from non-white ethnic groups. In particular, female IT specialists were almost five times as likely to be working part-time than males working in IT positions.

Female IT specialists are almost five times as likely to work part-time

Figure 18: IT inclusion and the incidence of part-time working, 2016



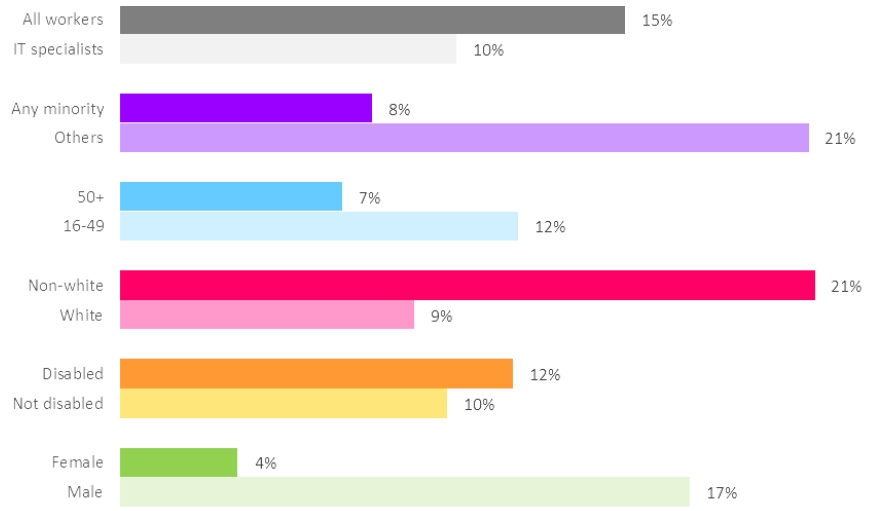
Source: Analysis of ONS Quarterly Labour Force Survey by BCS

Working part-time is a life style choice for many people, but for approximately 10% of all IT specialists in 2016 this mode of working was an enforced one as they were unable to find the full-time work desired. Interestingly, the likelihood that IT specialists from minority groups as a whole were unable to find full-time work was lower at 8% though, in the case of those from ethnic minority groups, the figure was more than double this level at 21%.

Perhaps the most striking difference between minority/non-minority groups is the proportion of female IT specialists that had taken part-time work due to an inability to find full-time jobs which was less than a quarter of that registered amongst males in IT positions.

Part-time working is more often a life style choice for IT specialists and women in particular

Figure 19: Part-time IT specialists unable to find full-time work,(2014-16)



Source: BCS analysis of ONS Quarterly Labour Force Survey data

7.2 Remuneration

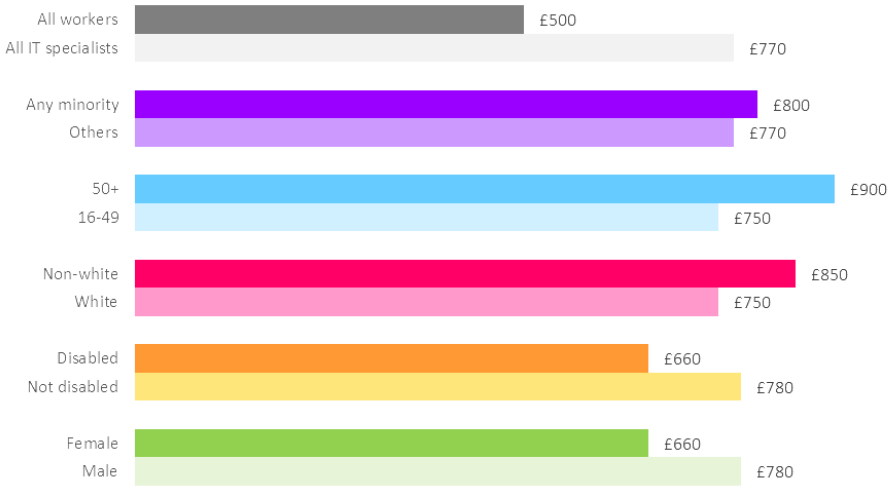
On average, IT specialists are well paid compared with other workers and, in 2016, the gross weekly (median) wage for people working in full-time, permanent IT positions was 36% higher than the norm at £770 per week compared with a figure of £500 per week for all employees.

Surprisingly perhaps, IT specialists from minority groups were found to have higher weekly earnings (£800 per week). This can be attributed to the impact of earnings data for those aged 50 and above and, in addition, those from non-white ethnic groups. Both of these groups reported earnings levels much higher than their counterparts - 19% and 13% higher than younger employees and white employees respectively.

Earnings amongst female and disabled IT specialists are well below the norm

For women and disabled IT specialists however, the reverse was true. While male IT specialists reported earnings of £780 per week, females in the same profession were receiving 15% less (£660 per week). Meanwhile, IT specialists with disabilities were found to be earning 16% less than their non-disabled counterparts (i.e. £660pw and £780pw respectively).

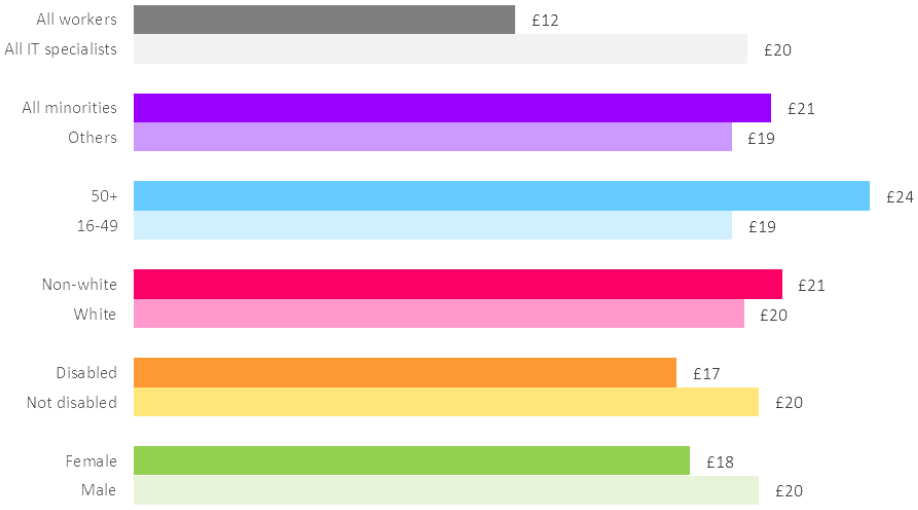
Figure 20: IT inclusion and (median) weekly earnings for full-time employees, 2016



Source: Analysis of ONS Quarterly Labour Force Survey by BCS

It could, of course, be argued that weekly rates of pay, even amongst full-time staff, are affected by many factors – not least hours worked. Indeed, accounting for the number of working hours does change the picture slightly, however this analysis still shows women in IT positions were earning 11% less than their male co-workers in 2016 and those classified as being disabled earning 13% less than IT specialists without disabilities.

Figure 21: IT inclusion and (median) hourly earnings for full-time employees, 2016



Source: Analysis of ONS Quarterly Labour Force Survey by BCS

Older IT specialists and those from ethnic minority groups earn more

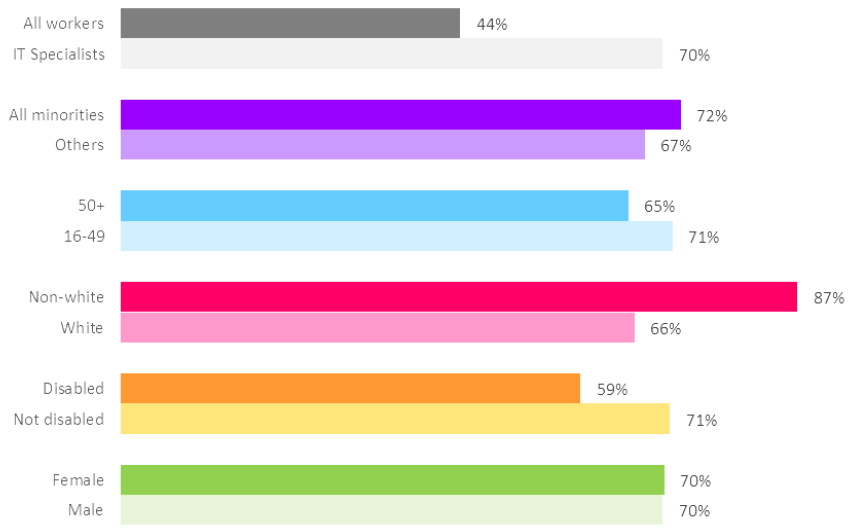
8 Skills

8.1 Qualifications held

IT specialists are much more highly educated than other workers, and in total 70% were thought to hold an HE level qualification in 2016 compared with just 44% of the entire workforce. Amongst IT specialists from each of the minority groups analysed the proportion holding HE awards was also higher than workers more generally, though not always by comparison with their non-minority counterparts in IT.

IT specialists and those from ethnic minorities in particular are more highly qualified than other workers

Figure 22: IT inclusion and the incidence of HE level educational attainment, 2016



Source: Analysis of ONS Quarterly Labour Force Survey by BCS

Disabled IT specialists are less likely to hold HE level awards

The most noticeable differences in educational attainment for IT specialists was amongst white versus non-white workers, of which 66% and 87% respectively were found to have an HE level qualification, and between disabled/non-disabled IT workers (figures of 59% and 71% respectively).

8.2 IT degrees in the workplace

Though the possession of an IT (computer science) degree could perhaps be considered a prerequisite for employment as an IT specialist, in reality it is estimated that only around 17% of individuals working in IT positions hold a qualification of this nature – 12% at undergraduate and 5% post graduate level. The figure is still lower for IT specialists that are older (11%), or disabled (13%). This is especially true amongst female IT specialists - of which just 8% are thought to hold an undergraduate/post-graduate degree in an IT related discipline.

Only 17% of IT specialists and 8% of female IT specialists have an IT degree

Figure 23: IT inclusion and prevalence of IT degrees, 2016

	All undergraduate computing degrees	All higher computing degrees	Has IT degree
Male	14%	5%	19%
Female	6%	3%	8%
Not Disabled	13%	5%	17%
Disabled	7%	6%	12%
White	13%	4%	16%
Non-white	11%	9%	19%
16-49	14%	5%	18%
50+	6%	5%	11%
Others	17%	5%	21%
Any minority	8%	5%	13%
IT specialists	12%	5%	17%
All workers	1%	0%	1%

Source: Analysis of ONS Quarterly Labour Force Survey by BCS

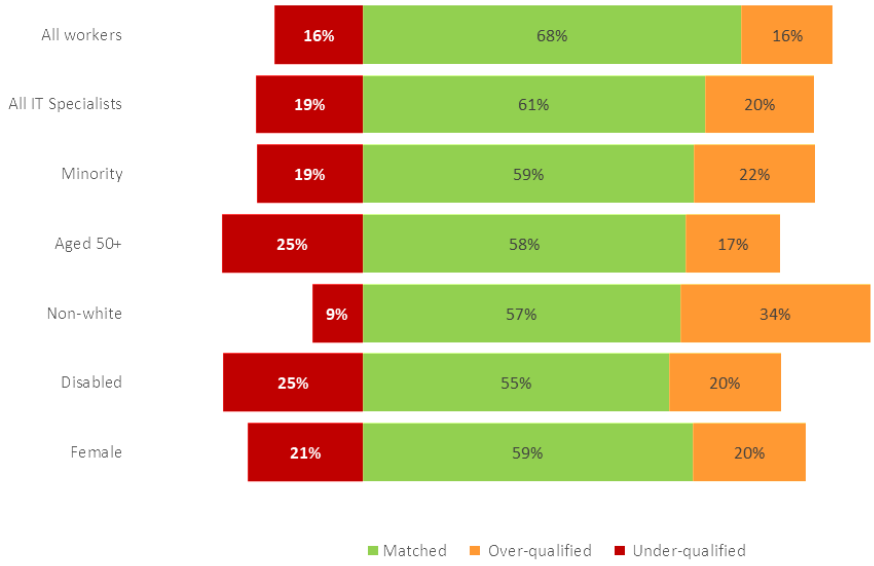
The difference between minority/majority groups holding IT degrees was most pronounced at undergraduate level and for IT specialists that were female, over 50 or disabled. In these areas the proportion of workers with IT degrees was less than half that of their counterparts.

8.3 Skills matching

By comparing the actual level of educational attainment for individual IT specialists alongside the average level reported by those working in such roles it is possible to develop a series of estimates showing the degree of skills matching (using education as a proxy for skill in each case) within the IT workforce. Using this methodology, it becomes apparent that a lower proportion (63%) of IT specialists have skills at the necessary level for their job than is the case for UK workers as a whole (68%) and amongst the minority groups discussed, the proportion was lower still (59%) with the poorest match amongst those that were disabled (55%).

IT specialists' skills are poorly matched compared with other workers

Figure 24: IT inclusion and skills (education) matching, 2016



Source: BCS analysis of ONS Quarterly Labour Force Survey data

Where skill levels were not matched, it would appear that for IT specialists at least there is a greater likelihood that individuals have skills at a level lower than that required (i.e. 20% of IT specialists compared with 15% of all workers) and this appears to be a particular issue amongst older and disabled IT workers in particular (25% in each case). By contrast the mismatch in skills held by IT specialists from non-white ethnic groups is primarily due to their being over qualified for work (34%).

Disabled and older workers are more likely to be under-skilled

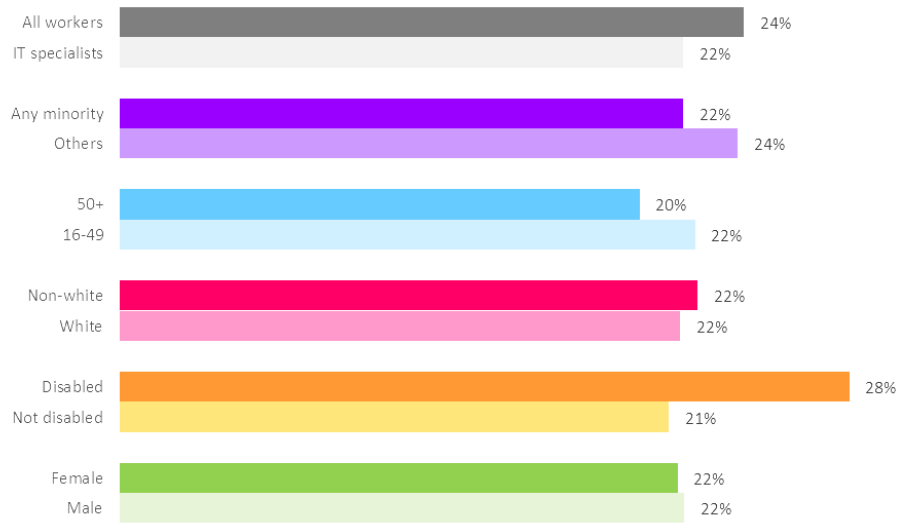
8.4 Skills development

Given that the likelihood of skills matching is lower amongst IT specialists than amongst other workers it might be hoped that to compensate, skills development amongst IT professionals would be above the norm. However, data from ONS suggests that this is not the case and whilst 24% of workers in the UK received some form of education/training during 2016, the figure for IT specialists was lower at 22%.

The incidence of education/training reported by those from minority groups in IT roles varied little about this figure with the exception of disabled IT specialists who were notably more likely to have undertaken education / training than other workers (with figures of 28% and 21% respectively).

IT specialists are less likely to receive education and training

Figure 25: IT inclusion and the incidence of education/training, 2016



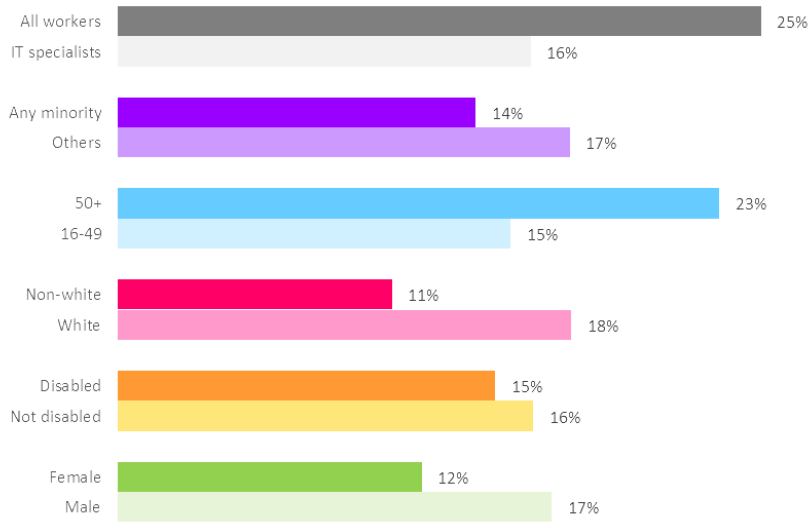
Source: BCS analysis of ONS Quarterly Labour Force Survey data

Of course, not all offers of education/training offered by employers are taken up by members of the workforce who may be prohibited from benefitting from such development due to work commitments, illness or other reason. However, again, when comparing figures for education/ training received by or offered to minority versus non-minority there was little difference in the trends observed and commented upon above.

8.5 Skills sourcing

The 2010 Equality Act legislates not only for those in work but also those seeking employment – providing a means of redress to those treated unfairly during the recruitment process, directly or indirectly. This is important for IT recruiters/employers as one of the primary means by which IT specialists are seen to find employment is through existing employees (16% of cases). As a result, if inclusion levels are low for a specific social group of people within a firm, this could potentially have an indirect discriminatory effect upon other individuals from like groups that were seeking employment of this nature.

Figure 26: IT inclusion and incidence of securing work via in company contact (2014-2016)



Source: BCS analysis of ONS Quarterly Labour Force Survey data

In fact, as illustrated in figure 26, the use of existing contacts to obtain IT work is lower in each of the minority groups covered by this report than their non-minority equivalents, with the one exception being that of older workers for whom comparative the incidences were 23% and 15% respectively for those aged 50+ versus 16-49.

9 Conclusion

If you're reading this conclusion, you'll already know that the IT profession is integral to the country's success and prosperity both today, and in our post-Brexit future. It's a sector that will continue to grow, but if the benefits of this growth are to be spread across all of society, it is vital that the IT profession leads in making sure that it is representative of the UK as a whole; that's how we help make IT good for society.

Sadly though, as this report shows, despite being a relatively new sector, where someone's ability should be the only barrier to entry, ours is a sector where:

- Woman are underrepresented by 30 percentage points.
- When it comes to older people and those with disabilities, the sector employs proportionately fewer than the total workforce in every UK region.
- If you are a member of any of the minority groups analysed, you are less likely to be in full-time, paid work than your non-minority counterparts.
- If you are a woman, or a person with a disability, you are likely to be paid 15% and 16% less respectively than your non-minority counterparts.

From a gender perspective, the numbers look depressingly familiar to those that we have reported on annually for the past three years.

Whichever way we look at it, these figures make for sobering and depressing reading. Whatever actions that have been taken so far to instigate change, simply aren't having the marked and imperative change that we need. We believe that real change has to come from the top. And that change can, and should start - now.

Men run most of the organisations in our sector, so we have to start there. As they are four times more likely than women to say that they don't see discrimination happening, we clearly need to change the entire way that they think.

We need to point out to them why they need to change the way that they encourage, recruit, promote, recognise and reward people from our identified minority groups. They need to do it in their role as business leaders, but also in their roles as fathers, grandparents, uncles and cousins. We also need to point out how they can implement some simple changes to make a difference. My own organisation for example, uses contextualised recruitment to make more informed choices about candidates by considering the context in which their academic achievements have been gained. Unconscious bias training needs to be more thoughtful about ethnicity and disability. Career counselling must take into consideration the different pressures that ethnic backgrounds and disability place on people as they go through their careers. Job assessment marking needs to recognise that women tend to underestimate their own skills, whereas men overestimate their's, thus leading to fewer women being selected for interview.

I could go on. There are lots of examples where simple, organisational changes can be made to alter the status quo – but it will require a a myriad of changes, sustained focus and collaboration across organisations, employers, government, schools and community groups if we're to change anything.

That's why, with the publication of this report, BCS is calling for each and everyone of us to make a simple pledge to take one action to make that difference.

Treating everyone with respect and improving diversity in our sector is surely a key element of making IT good for society. In 2017 it seems incredible that this is still an issue to be tackled, but it is, and that's why everyone has to realise that they have a responsibility in changing this – for the better.

As Sheryl Sandberg would say, we, the diverse and under-represented, need to 'lean-in'/take chances/say 'I can do this', because when we try, we achieve things we never even thought possible. We need to step forward, smile and engage.

Rebecca George OBE
Vice Chair, Public Sector Lead at Deloitte;
Vice-President, BCS Organisation and Employers Board

Data notes:

1. This report contains statistical data from ONS which is Crown Copyright. The use of the ONS statistical data in this work does not imply the endorsement of the ONS in relation to the interpretation or analysis of the statistical data and research datasets employed may not exactly reproduce National Statistics aggregates.
   Annual figures presented are derived from the ONS Labour Force Survey (LFS) and have been produced by averaging results for the four quarters of any given year/years. Further details of the LFS can be obtained direct from ONS website https://www.ons.gov.uk/surveys/informationforhouseholdsandindividuals/householdandindividualsurveys/labourforcesurveylfs
2. In cases where estimates span multiple years, this amalgamation has been undertaken to overcome issues of small sample sizes which otherwise render estimates unreliable and/or potentially disclosive.
3. Numerical estimates are rounded to the nearest 1,000, percentages (normally) to the nearest whole number, and rates of pay to the nearest £10 (weekly) or £1 (hourly), as such totals given may not equal the sum of related subsidiary figures.
4. IT specialists are defined by Standard Occupational Classification (SOC2010) codes 1136, 2133-9. 3131/2 and 5245. The 'Tech industries' are defined by a series of Standard Industrial Classification (SIC) codes which are available on request.
5. Unemployment rates (for IT specialists) are derived by dividing the number of individuals classed as ILO unemployed (previously working as an IT Specialist) by the total number of people working (as an IT Specialist) plus the number unemployed (previously as an IT Specialist).
6. Levels of skills/educational match amongst IT specialists are based upon the methodology utilised by the ILO/ONS details of which are available from the ONS release: Analysis of the UK labour market - estimates of skills mismatch using measures of over and under education: 2015.

For further information please contact:

BCS First Floor, Block D
North Star House
North Star Avenue
Swindon
SN2 1FA

+44 1793 417417
www.bcs.org