Research Bulletin 19/8 | Skills Demanded by the Digital IT Sector

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Summary

This research bulletin provides analysis of the demand for Information Technology (IT) workers in Northern Ireland (NI) and the related skills that are in demand. It shows that economic expansion and jobs growth has been strong for businesses likely to have a high proportion of IT workers. In addition, it presents findings from the 2019 Skills Barometer that reveals demand for IT workers is expected to continue to be strong and that many of these workers will need at least degree level qualifications.

Data from Burning Glass, an innovative web-scraping tool of online job vacancies, is used to show that approximately one in every ten job postings in NI are for IT workers with demand rising for such employees even since 2016. Some skills required have increased in demand whilst others have fallen with new skill requirements emerging, such as DevOps, Git, Continuous Integration and Scrum. The median salary reported for IT workers is higher than on average across NI - as is the minimum level of education needed.

Introduction

Northern Ireland's (NI) economic story of the past six years has been one of two halves. There has been sluggish economic growth but relatively robust jobs growth. However, behind the numbers, it is clear that there are areas of real strength.

This bulletin examines the increasing demand for IT workers and what exactly the jobs market is demanding from such workers. It firstly considers official economic data for parts of the Information and Communication (ICT) sector before examining the anticipated demand for IT workers using results from the 2019 Skills Barometer. Furthermore, it considers results from Burning Glass Technologies examining the number of job postings, the economic sectors demanding IT workers, the salary distribution, the skills in demand and the level of experience required.

Demand for IT Workers

According to bespoke data from NISRA's Labour Force Survey[i] there were 28,000 IT[ii] workers in NI in 2018 with the majority concentrated in the Transport and Communication sector (11,000) and the Banking and Finance sector (7,000). However, a further 10,000 IT workers are spread across other economic sectors.

Given the spread of IT workers across NI's different economic sectors, it is difficult to examine growth of the businesses that have an IT aspect to their economic output. Parts of the ICT sector are however likely to demand a high level of IT workers such as Computer Programming and Consultancy. Information on this sub-sector is more readily available and shows that jobs and economic output have more than doubled since 2010[iii], well surpassing industry averages. Growth in the number of jobs in the ICT sector[iv] is shown in Figure 1.

Figure 1: Jobs in the ICT Sector
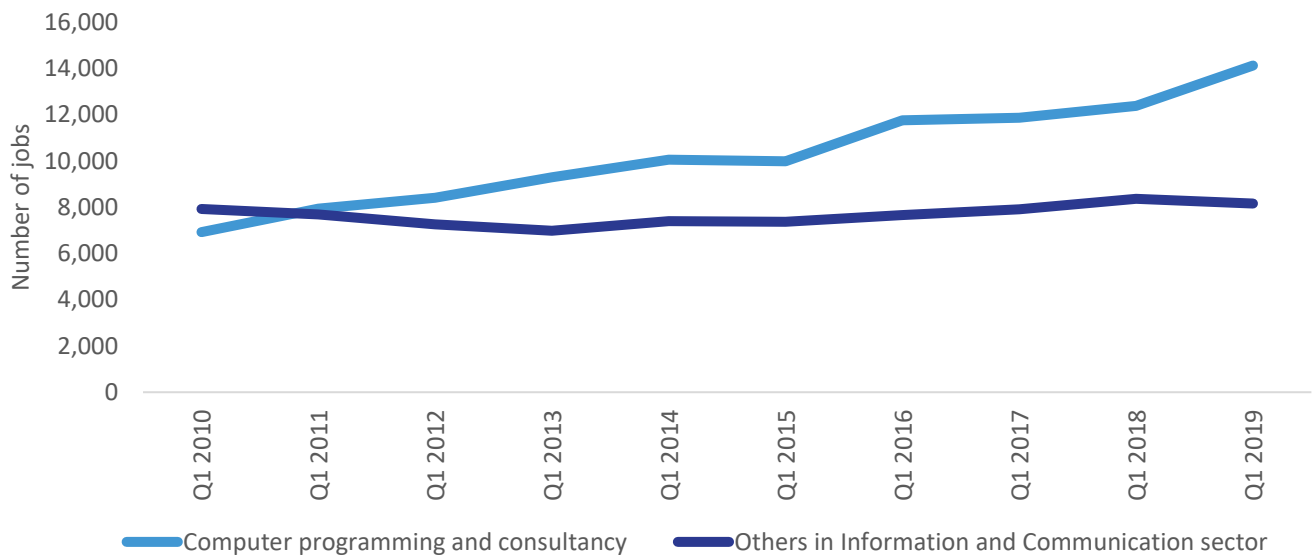
The jobs growth experienced in the ICT sector since 2010 has been concentrated in the Computer Programming and Consultancy sub-sector. Growth in economic output (as measured by Gross Value Added (GVA)) of the Computer Programming and Consultancy sub-sector in NI against equivalent growth in the UK since 2010 is shown in Figure 2.

Figure 2: Economic output growth in Computer Programming and Consultancy, NI and UK (2010 = 100)
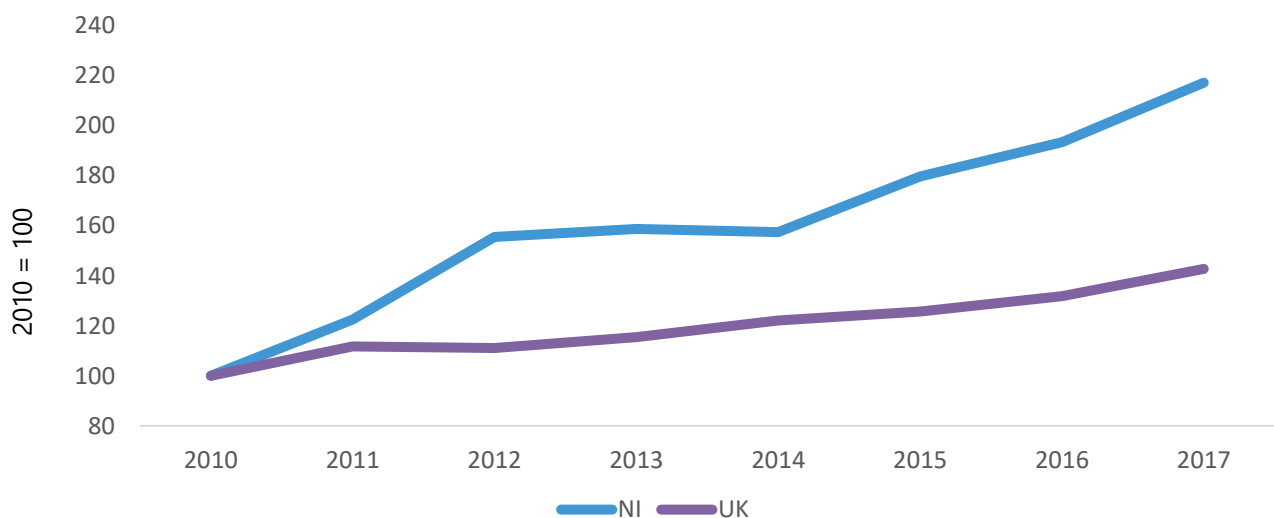
NI's economic output in this sub sector more than doubled over the seven years to 2017, comparing favourably to 43% growth for the UK as a whole over the same period. However, computer programming and consultancy only makes up 1.7% of NI's economic output, compared to 2.6% for the UK as a whole.

Anticipated Demand for IT Workers

Results from the 2019 Skills Barometer[v] show that under a high growth policy success scenario (aspirational scenario based on NI achieving its economic ambitions), the demand for IT workers (IT and Telecommunications professionals and IT technicians) is expected to be high. It estimates that over 1,500 IT workers will be required annually over the next decade, with just over 70% of these expected to need National Qualification Framework (NQF) level 6 and above qualifications (equivalent to at least degree level). In contrast, only 8% of future demand for IT workers will be at NQF level 2 and below (equivalent to GCSE and below). Demand for IT workers by qualification level is shown in Figure 3.

Figure 3: Qualification Levels required for anticipated annual demand for IT workers (2018-28)
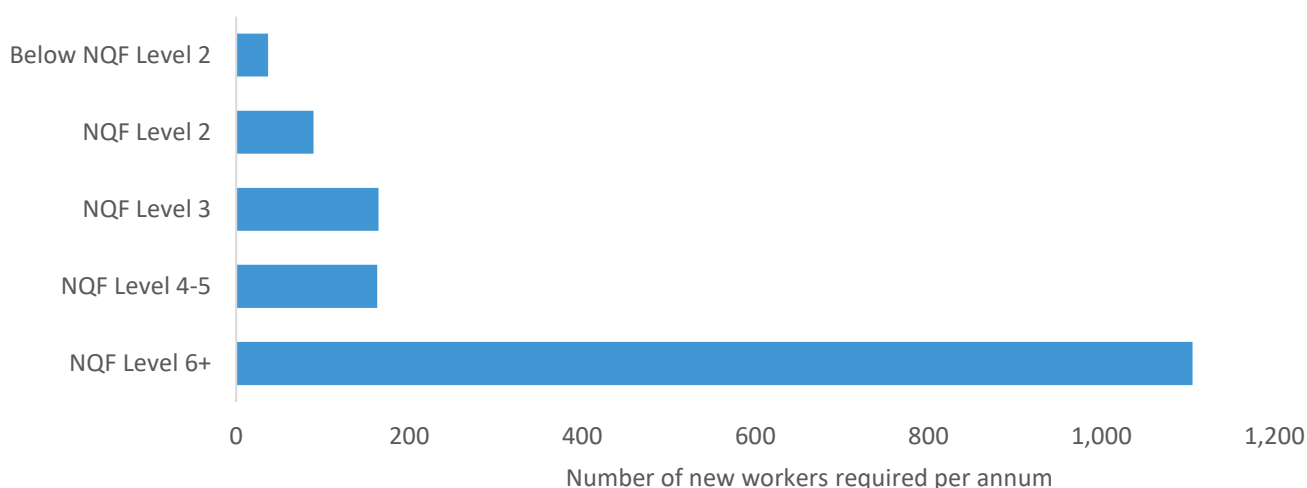

Source: 2019 Skills Barometer databank. IT workers defined as SOC 213 Information technology and telecommunications professionals and SOC 313 Information technology technicians.

Note: NQF Level 2 equates to 5 GCSEs Grade A*-C (or equivalent); NQF Level 3 equates to A-Level (or equivalent); NQF Level 4-5 equates to Foundation Degree/HNC/HND (or equivalent); and NQF Level 6+ equates to degree and above (or equivalent).

Given the anticipated strong demand for IT workers and associated demand for a high proportion of such workers with NQF level 6+ qualifications, it is of no surprise that computer science is estimated to be the second highest demanded subject at degree level (only nursing is higher). The Skills Barometer model estimates that there will not be enough students or immigrants with computer science degree level qualifications supplied to fill this demand, with a gap of approximately 200 every year between supply and demand. The subjects with the greatest anticipated shortages are shown in Figure 4.

Figure 4: Supply Gap by subject (JACS 2 digit)
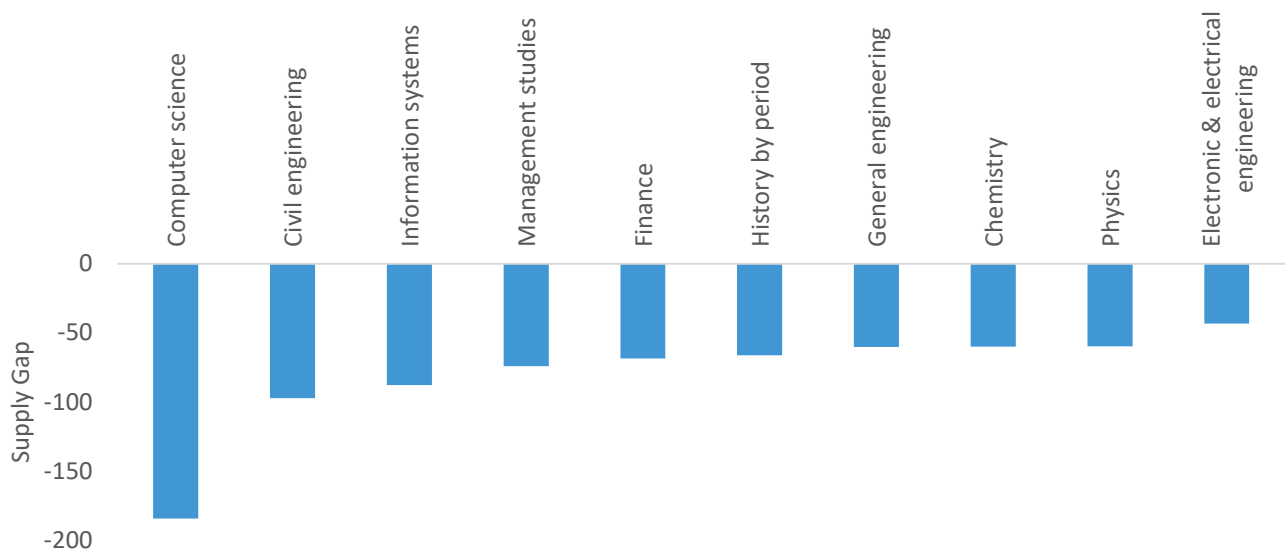
Source: 2019 Skills Barometer.

Note: JACS (the Joint Academic Coding System) refers to a classification system for classifying academic subjects and modules. 2 digit refers to the principal subjects that fall under nine subject areas.

As well as Computer Science being undersupplied, most of those subjects that top the list of predicted shortages are likely to be in STEM related subjects. An important aspect of addressing any undersupply could be attracting NI domiciled students who studied Computer Science in Great Britain back to NI. Bespoke data from NISRA's Destinations of Leavers from Higher Education Survey[vi] indicates that only 37% returned to NI for employment over the past five years to 2016/17 (of those who were in employment six months after qualifying).
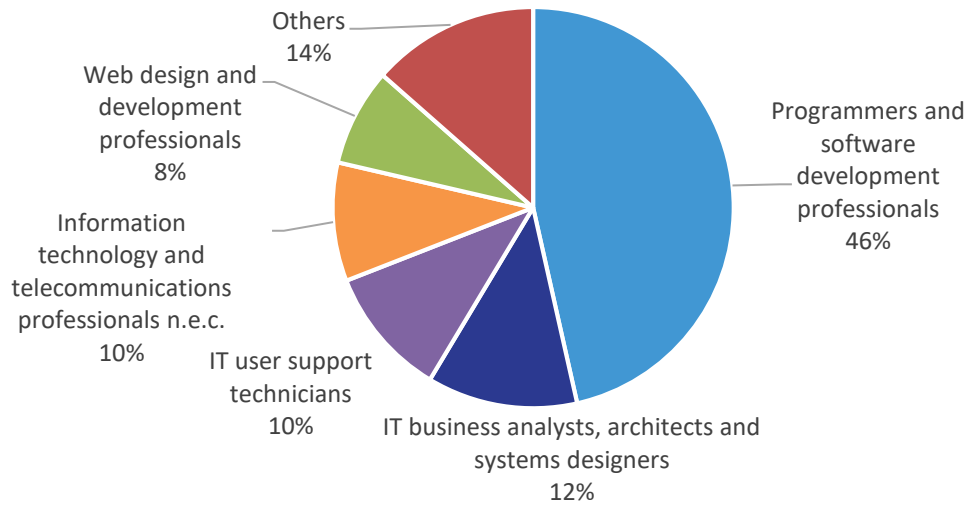
Jobs Market – Headline Findings

This section will examine what has been happening in the jobs market for IT workers and the skills demanded using Burning Glass Technologies[vii], an innovative web-scraping tool of online job vacancies.

In 2018, there were more than 13,000 job postings for IT workers in NI; this accounts for around one in every 10 job postings in NI and an increase of 1,000 compared to two years earlier. However, the NI market only accounted for 1.4% of IT job postings across the UK.

Almost nine of every ten job postings in NI for IT jobs were located in Belfast.

Figure 5 shows the job postings by IT occupation with almost half of IT job postings for programmers and software development professionals. IT business analysts and IT user support technicians come in second and third for job postings respectively, with the top three accounting for two-thirds of all IT job postings during 2018.

Figure 5: Job Postings by Occupation

Others
14%

Web design and
development
professionals
8%

Information
technology and
telecommunications
professionals n.e.c.
10%

IT user support
technicians
10%

IT business analysts, architects and
systems designers
12%

Programmers and
software
development
professionals
46%

Source: Labour Insight Jobs (Burning Glass Technologies)

Only one-quarter of IT job postings specified an economic sector. Of those where one was specified, computer programming and consultancy (17%), financial services (16%) and legal and accounting activities (12%) topped the list. However, it should be noted that there was a relatively large spread of economic sectors represented. The top 10 sectors are shown in Figure 6.

Figure 6: Job Postings by Economic Sector

Number of job postings
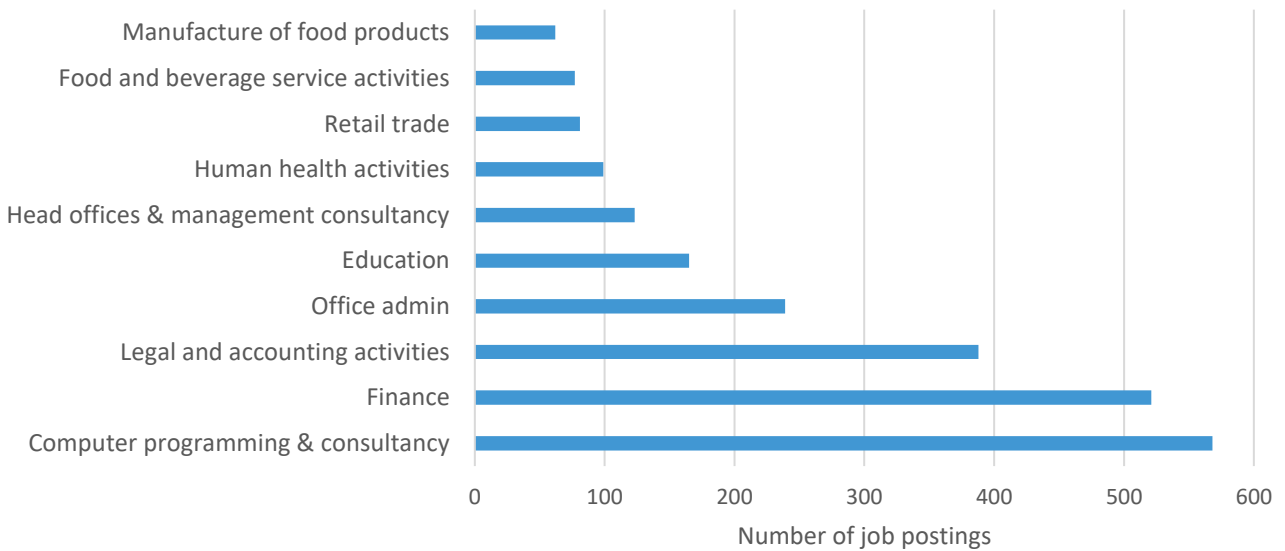
Source: Labour Insight Jobs (Burning Glass Technologies).

Of those IT job postings that specified an employer (28% of job postings), the most active in 2018 were Citi, PwC, Allstate, Deloitte and CME Group. These accounted for around one quarter of job postings where an employer was identified in the job posting.

Jobs Market – Skills

The draft Industrial Strategy for Northern Ireland sets out a vision for a globally competitive economy for everyone. To achieve this, it identifies six sectors where NI is either world class or has potential to become world class. Whilst IT workers will be required in all of these priority sectors to ensure growth can be supported, they will be fundamental to the 'Digital and Creative Technologies' sector. If NI does not sufficiently supply or attract enough people for this sector, it could limit its possible growth. It is therefore imperative that the supply of people matches with the demands from businesses.

The demand for IT workers has increased but the skills demanded of those workers has changed, even from 2016 to 2018. Table 1 provides an indication of the skills that have been increasing in demand (more than 100 additional job postings with stated skill between 2016 and 2018), those that have remained steady (job postings with stated skill have increased up to 99 or reduced by less than 100), those decreasing in demand (over 100 fewer job postings with stated skill or no longer in top 25 in 2018) and those that are new to the list (top 25 in 2018 but not in 2016). It only considers the top 25 skills demanded in both 2016 and 2018.

Table 1: Skills in demand for IT workers

Increasing	Decreasing	Neutral	New
Software Development	HTML5	.NET	DevOps
SQL	IT Support	Customer Service	Git
Java	jQuery	Project Management	Continuous Integration
Software Engineering	Cisco	Web Development	Scrum
JavaScript	Technical Support	UNIX	
Microsoft C#	Active Server Pages (ASP)		
Teamwork/Collaboration	SQL Server		
Linux	ASP.NET		

Source: Labour Insight Jobs (Burning Glass Technologies).

Those in vogue include DevOps, Git, Continuous Integration and Scrum whilst those decreasing in demand include HTML5, jQuery and ASP.NET. When considering programming languages alone, the top languages demanded through job postings in 2018 were as follows: SQL; Java; JavaScript; Microsoft C#; LINUX; .NET; Python; and C++. Whilst in a different order, these were also amongst the top languages in demand for the UK as a whole.

Only 3,500 job postings for IT workers in NI during 2018 stated a minimum level of education needed. Of those that did, around four-fifths (81%) were for degree level qualifications. This is much higher than across all NI job postings where less than half (46%) of job postings required degree level qualifications. There were 1,900 job postings that stated the subject area required by the company. Those highest in demand were computer science, computer software engineering, engineering, electrical and electronic engineering technologies and mathematics.

Of the almost 4,000 job postings for IT workers in NI that stated a required level of experience during 2018, almost half (48%) asked for two years or less experience with the remainder (52%) of job postings requiring workers with at least three years' experience.

Jobs Market – Wage premium for IT workers

NISRA's Annual Survey of Hours and Earnings (ASHE) provides official wage data on some of NI's IT workers for 2018. It estimates that the median gross annual salary for IT and telecom professionals (SOC 213) to be approximately £35,000 and for IT technicians (SOC 313) it is estimated to be lower at £27,000. There are no official estimates for IT engineers (SOC 5245) or IT and telecom directors (SOC 1136). It should also be noted that ASHE only provides information on employees who have been in their job for more than one year so is unlikely to provide insight into current job market conditions.

This section examines salary information from job adverts from Burning Glass. Almost three-fifths (59%) of job postings for IT workers in NI during 2018 contained information on salary. It indicated that the median real-time salary for IT workers was £35,000, well above the NI average (£25,000 median for postings across all occupations in NI during 2018). The salary distribution for IT workers is shown in Figure 7.

Figure 7: Salary distribution for IT workers, 2018
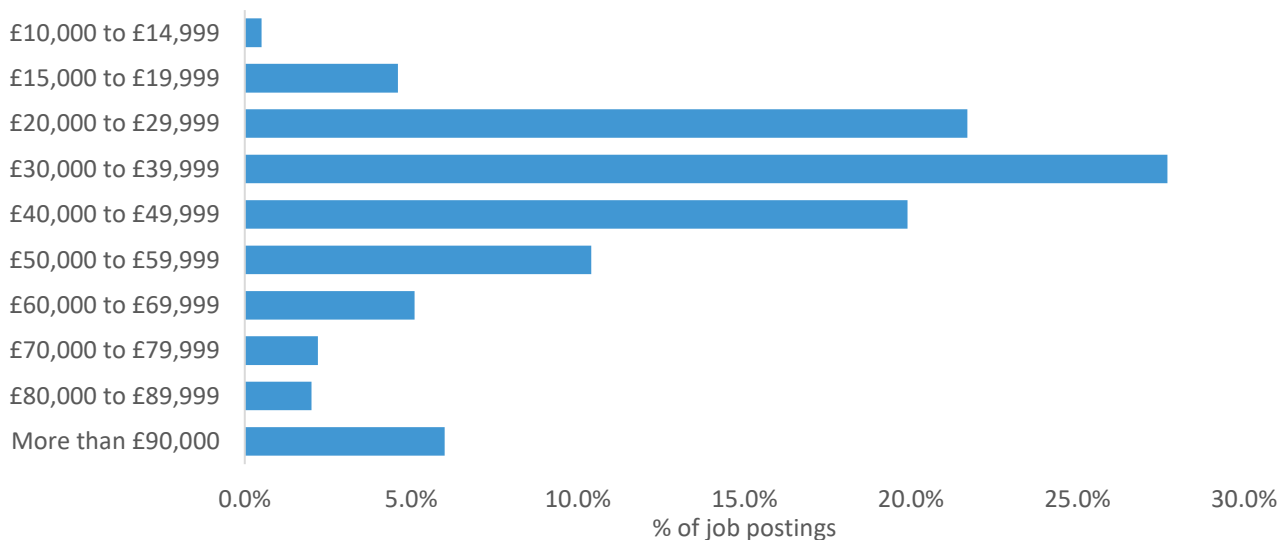
Source: Labour Insight Jobs (Burning Glass Technologies).

The figure shows that around one-quarter of reported salaries for IT workers were £50,000 or more; this compares to around 10% across all occupations in NI during 2018. Only 1% of all job postings in NI had reported salaries greater than £90,000 but this increased to 6% for IT workers.

However, the median salary of £35,000 for IT workers was joint lowest of the UK regions, alongside Wales and the North East. The median for IT workers across the UK was £42,500 but this is skewed towards London (£57,500) which was the only UK region to have a median salary in excess of the UK median.

Conclusion

This analysis shows that, while focussed in the Transport & Communication and Banking & Finance sectors, IT employees work across many different economic sectors and they normally need at least degree level qualifications. The demand for such workers is expected to grow over the next decade with the NI economy not producing enough graduates or attracting enough immigrants with computer science degrees.

Data from Burning Glass demonstrated that the jobs market for IT workers in NI is healthy, although there are fewer IT job postings in NI relative to other UK regions. It revealed that the skills-set employers demand from IT workers has changed somewhat since 2016. In addition, it showed there is a wage premium associated with IT workers compared to the NI average. However, employers also demand higher qualifications for IT workers compared to the NI average.

The draft Industrial Strategy for Northern Ireland has identified Digital and Creative Technologies as one of the six economic sectors in which NI has or has the potential to be world class. It will therefore be imperative that the supply of workers can meet the needs of the sector to support its growth. IT workers will be vital to this sector and in particular those with at least NQF Level 6 qualifications. Computer Science is already the third highest supplied subject at local higher education institutions (only behind nursing and teaching). However, it is also the most under-supplied.

Government, businesses and education providers are already working together to come up with solutions to address supply gaps. Among other things, this is already evidence of this by Careers advisers supplying leaflets[viii] on the skills in greatest demand in NI, the IT academies run by the Assured Skills Programmes that has led to over 250 people gaining employment since 2016/17, Invest NI's Skill Growth Programme and the recent formation of the CBI Digital Forum.

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[i] https://www.nisra.gov.uk/statistics/labour-market-and-social-welfare/labour-force-survey

[ii] Defined as the following occupations: SOC 5245 (IT Engineers), SOC 213 (Information Technology and Telecommunications), SOC 1136 (Information technology and telecommunication directors) and SOC 313 (Information Technology Technicians).

[iii] Quarterly Employment Survey and Regional GVA, ONS

[iv] https://www.nisra.gov.uk/statistics/labour-market-and-social-welfare/quarterly-employment-survey

[v] https://www.economy-ni.gov.uk/publications/northern-ireland-skills-barometer-2019-update

[vi] https://www.economy-ni.gov.uk/articles/destinations-leavers-higher-education

[vii] Burning Glass Labour Insight (https://www.burning-glass.com/products/labor-insight/) is a software package which scans job postings from more than 40,000 sources posted online (through recruiters, job websites or company sites) and pulls data together in a standard format describing the specific skills, education, experience and work activities required, allowing users to interrogate the results. It should be noted that Burning Glass provides a valuable source of data on the jobs market but should be used as complementary to official data. The data from Burning Glass comes from job adverts and is therefore dependent on what employers put in those adverts. It is also worth noting that a job posting may not always indicate an actual vacancy as some postings can refer to posts yet to be created. Other limitations in the data include the actual level of detail in job adverts (which can vary for different postings) and the fact that most postings tend to be from larger companies, as smaller businesses tend not to use online adverts.

[viii] https://www.economy-ni.gov.uk/sites/default/files/publications/economy/ni-skills-barometer-2017-infographic.pdf