Technology Insights 2012

e-skills uk

United Kingdom

> **Northern Ireland**

Scotland

Wales

e-skills UK is the Sector Skills Council for Business and Information Technology; an employer–led organisation rated as 'outstanding' in the re-licensing of the Sector Skills Councils. e-skills UK's mission is to ensure the UK has the technology skills it needs to compete in the global economy, working on behalf of employers to develop the software, internet, computer gaming, IT services and business change expertise necessary to thrive.

Focused on making the biggest contribution to enterprise, jobs and growth across the economy, e-skills UK's three strategic objectives are to:

- inspire future talent,
- support IT professionals,
- increase digital capability.

Delivery on these strategic objectives is underpinned by employer engagement across the sector, authoritative research, a continually developing sector qualifications and learning strategy and effective strategic partnerships.

An e-skills UK publication

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- e-skills UK Board members:

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Key Facts

This section summarises the key facts from this report.

The importance of IT & Telecoms to Northern Ireland's economy

- Today, the IT & Telecoms industry contributes in excess of £0.8 billion[1] or 1.4% of Northern Ireland's total Gross Value Added (GVA).
- Optimisation of ICT[2] by businesses could generate an additional £0.7bn GVA to the Northern Ireland economy over the next 5 to 7 years.
- It is estimated that the ICT driven GVA uplift of £0.7bn in Northern Ireland's economy could translate into 10,000 new jobs, across many occupations and sectors, over the next 5 to 7 years.
- Looking at the UK as a whole an estimated 8.2 million UK adults remain off-line in the UK at present.
- Those suffering 'Digital exclusion' will be unable to benefit from the wide and growing range of personal benefits in accessing the web.
- The potential economic benefits that could result from getting everyone in the UK online as in excess of £22 billion.
- The internet is also a catalyst for job creation ....with 2.6 jobs created for each one lost to technology-related efficiencies.

IT & Telecoms: underpinning Northern Ireland's employment

- Northern Ireland accounts for 3% of the UK's population, workforce and business establishments.
- GVA per head in Northern Ireland is significantly lower than other nations and regions (at 79% of the UK average) as are average rates of pay (88% of the average).
- In Northern Ireland in 2011 nearly three quarters (71%) of IT & Telecoms professionals worked in either managerial, strategic or software roles with the large proportion of these (69%) employed as Software Professionals.
- Analysis of Northern Ireland's employment trends for IT & Telecoms professionals over the last ten years shows a significant increase in the number of these higher level roles, increasing by 67% in this period. By contrast, those in IT & Telecoms Technician/Assistant/Engineering roles have decreased by a quarter (25%).
- The proportion of 'young people' (those aged 16-24) working as IT & Telecoms professionals in Northern Ireland is notably lower than that for workers in other occupations (i.e. 10% and 13% respectively).
- Gender also remains a significant issue - just 25% of IT & Telecoms professionals in Northern Ireland are female. By comparison, across all other occupations in Northern Ireland, females account for around half of the workforce.

[1] Based on SIC Codes 61 and 62

[2] ICT refers to Information & Communications Technologies and where it is specifically identified as ICT in third party sources this terminology has been kept. The preferred referencing used more generally throughout this report is IT & Telecoms

The changing environment and economic outlook

- In Northern Ireland, whilst business optimism is, on balance, positive, it is down on previous years driven largely by increasing concern in IT & Telecoms companies.
- The major concerns for businesses are: the state of the global economy, national/government debt, and the availability of business credit.
- Even with continued concerns over the economy, over half of all companies surveyed for the ICT Snapshot[3] in Northern Ireland were predicting an improvement in productivity, turnover and sales over the coming year coupled with a predicted increase in the development of new products and services.

Demand and supply of IT & Telecoms labour and skills

- There were approximately 500 advertised vacancies for IT & Telecoms professionals in Northern Ireland during each quarter of 2011, the majority of which (88%) were for permanent posts.
- As within the UK as a whole, the majority of adverts for IT & Telecoms positions in Northern Ireland were in the areas of Development, Design or Support (65%, 11% and 12% respectively) and these groups have accounted for an increasing proportion of advertised vacancies over each of the past three years (growing from 77% in 2008 to 88% in 2011).
- For each of the vacancies advertised, a range of generic skills and competences are required together with a variety of job specific, technical skills - the most commonly requested in 2011 being (in order of demand volume): SQL, .NET, Java, C#, C++, CAD, SQL Server, Unix, ASP and HTML.
- Amongst recruiters of IT & Telecoms staff across the UK as a whole, IT & Telecoms related skills shortages tended to be associated with Programmers/Software Developers and Web Design/Development professionals.
- Employers report that the technical skills that were proving hardest to fill across the UK were .NET/ASP.NET, Dynamics, SharePoint, Visual Basic/Visual Studio, C#, PHP and VMWare.
- Employment of IT professionals within the IT industry in Northern Ireland to 2020 is forecast to grow at 2.16% per annum – three times as fast as the Northern Ireland average.
- Growth in the IT & Telecoms professional workforce is forecast to be mainly amongst the more senior level/high value roles i.e. ICT Managers, IT Strategy & Planning and Software Professional roles whilst the number of people employed in lower skilled roles will increase only slightly.
- Through to 2015 there is a need for 2,300 new entrants a year into IT & Telecoms professional job roles in Northern Ireland – the majority of which (1,000/43%) are forecast to come from people working in occupations other than IT or Telecoms and with 400 (17%) coming from education.

[3] A yearly e-skills UK publication commissioned by DEL/Invest NI providing a dedicated source of information about ICT labour and skills in Northern Ireland

IT & Telecoms skills and development

- On average, IT & Telecoms professionals working in Northern Ireland are educated to a much higher level than other workers, with 70% holding an HE level qualification in 2011 compared with just 32% of those working in other occupations.
- Levels of educational attainment amongst IT & Telecoms staff in Northern Ireland are also well above the UK average (62%) though the converse was found to be true for those working in other occupations (32% being educated to HE level in Northern Ireland compared with 37% in the UK).
- Results from the Northern Ireland ICT Snapshot survey (January 2012) identify that 26% of all companies with IT staff are aware of gaps in the skills of these employees.
- These firms also report areas for skill improvement as being: Technical skills (78% of firms with skills gaps), Sector knowledge/experience (63%), Business skills (55%), Interpersonal skills (37%) and Leadership skills (29%).
- Similarly the results across the UK show that where they are apparent, skills gaps amongst IT & Telecoms professionals are likely to be both of a technical and non-technical nature and will often arise with respect to: sales/related, interpersonal and business/related skills (i.e. non-technical) along with ASP.NET, C,.NET, PHP and Linux (technical).
- Firms in Northern Ireland report skills gaps tend to cause an increase in workload for other staff and lead to outsourcing.
- Most recent estimates[4] suggest around 48% of IT & Telecoms professionals working in the UK will receive some form of job-related education/training each year compared with 51% of workers in other occupations.
- Around 25% of IT & Telecoms professionals in the UK received education/training each quarter during 2011 – this being significantly above the proportion receiving education/ training in Northern Ireland at that time (18%[5]).

IT related education and qualifications

- Across the UK, a key issue affecting undergraduate provision has been the large decrease in the number of applicants to IT related courses. Influenced by a number of factors and despite a 42% resurgence from 2007 to 2010, the number of applicants (UK domicile) to such courses in Northern Ireland has declined by 13% since 2002. By comparison, the total number of applicants (UK domicile) to all Higher Education (HE) courses in Northern Ireland has increased by 26% over the 2002-2010 period.
- Acceptances onto IT related HE courses in Northern Ireland declined over the 2002 to 2007 period but increased from the 2007 low of 645 to 845 in 2010.
- Across all IT related HE courses in 2010, 80% of acceptances were male and 20% were female.
- The number of UK domiciled IT related and Telecoms qualifiers from Higher Education Institutes (HEIs) in Northern Ireland increased by 2% from 2008/09 to 2009/10 compared to the UK as a whole, which decreased by 2%.
- In 2004/05 there were more than 22,000 enrolments onto IT & Telecoms professional and IT user Further Education (FE) courses in Northern Ireland. By 2009/10 this figure had fallen to just over 12,000 – a decline of 45%.

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[4] 2010

[5] Figure based on an eight quarter average over the 2010-2011 period

- Of those (of all ages) taking IT & Telecoms related FE courses in Northern Ireland in 2009/10, 56% were male and 44% were female. The proportions also vary significantly according to age group. 72% of those aged 19 or under taking such courses were male.
- Of the 6 colleges in Northern Ireland delivering IT & Telecoms related FE courses in 2009/10, Belfast Metropolitan delivered over a third (36%). Other notable colleges include South Eastern Regional (17%), North West Regional and Southern Regional (both 14%).
- In contrast to the UK as a whole, the number of students in Northern Ireland taking an IT related A-level has increased by 8% during the past year (2011), influenced wholly by the uptake of A-level ICT rather than A-level Computing where uptake in Northern Ireland has continued to decline.
- Whilst numbers taking IT related GCSEs across the UK declined by 69% from 2005 to 2011, numbers in Northern Ireland grew by more than a third (35%). However, the total IT related GCSEs sat as a percentage of all GCSEs sat has remained static at 5% over the past three years.

The wider population's use of IT

- Across the UK over 1 in 10 (13%) of people aged 16 or over have never used a computer.
- Around one in six (16%) employers in Northern Ireland were aware of gaps in the skills of their employees whilst, within the UK overall, around 42% of firms with skills gaps were also thought to have gaps in the skills of their IT users.

Global ambition and e-skills UK's strategic objectives

- e-skills UK's vision is that the UK and its constituent nations are recognised as global leaders in delivering business value from technology.
- Strategic action to accelerate the development of the skills pool in line with this vision is essential for the future.
- Information Technology and Communications systems are at the heart of every organisation, they underpin the delivery of high quality, cost effective public services, and they are central to the fabric of our daily lives.
- Based on the analysis and skills priorities set out in this document, and taking account of the current environment, e-skills UK will work together with partner organisations to deliver on three key strategic objectives to ensure Northern Ireland is truly world class at delivering maximum value from technology both in business and in society more widely, namely to:

  1. Inspire future talent: To motivate talented students to pursue IT & Telecoms related careers and better prepare all young people for work in a technology-enabled world.

  2. Support IT & Telecoms professionals: To develop the IT & Telecoms professional skills pool as the best in the world for deriving business benefit from technology.

  3. Increase digital capability: To trigger increased investment in the IT capability of all individuals and businesses in every sector.

1.0 Introduction

In the context of the current economic climate, high growth, high tech and innovative businesses are critical – they drive economic growth, productivity, global competitiveness and the creation of new jobs. By getting behind all high growth, innovative and technology companies and ensuring that businesses have the right skills they need to grow, Northern Ireland will be on the path to a new economic dynamism. The changing shape of the economy means that future growth will depend more and more on the technology sector, and so the technology skills needed for businesses to innovate will become increasingly important.

e-skills UK is the Sector Skills Council for Business and Information Technology; an employer–led organisation rated as 'outstanding' in the re-licensing of the Sector Skills Councils. e-skills UK's mission is to ensure the UK has the technology skills it needs to compete in the global economy, working on behalf of employers to develop the software, internet, computer gaming, IT services and business change expertise necessary to thrive.

Focused on making the biggest contribution to enterprise, jobs and growth across the economy, e-skills UK's three strategic objectives are to:

- Inspire future talent,
- Support IT professionals,
- Increase digital capability.

Delivery on these strategic objectives is underpinned by employer engagement across the sector, authoritative research, a continually developing sector qualifications and learning strategy, and effective strategic partnerships.

Building on previous research, e-skills UK has analysed the UK's IT & Telecoms workforce, technology trends, opportunities and challenges in order to deliver authoritative labour market intelligence which enables effective influence on policy, strategy and solution development. The resultant suite of publications, 'Technology Insights 2012' sets out the current reality, forecasts the future based on the best available intelligence, and assesses the implications for the IT & Telecoms sector.

This summary for Northern Ireland uses existing knowledge supplemented with new primary research amongst 196 employers in Northern Ireland; a summary of technology–related trends and their implications for the future; new employment forecasts (in partnership with Experian); and a detailed analysis of the workforce profile and current skills provision.

These reports will inform e-skills UK, government, education providers, employers and the IT & Telecoms sector of the implications of emerging trends and the changing environment.

2.0 The importance of IT & Telecoms to Northern Ireland's economy

2.1 IT & Telecoms and competitiveness

Northern Ireland is highly dependent on its IT & Telecoms workforce – it underpins the economy and is integral to information, business and consumer services, health and leisure and modern day social networking. Across all industries in Northern Ireland it is the combination of its highly skilled IT & Telecoms professionals, technology-savvy business leaders and competent IT users that enable their organisation's effective participation in the global digital economy.

'The last decade has seen ICT dramatically transforming the world, enabling innovation and productivity increases, connecting people and communities, and improving standards of living and opportunities across the globe'

World Economic forum

Though a direct comparison for Northern Ireland is not available, it is useful to reference the current global status/competitiveness of the UK as a whole, not least because of Northern Ireland's ambition to become the world's preferred destination for knowledge economy investment – as set out in *'Digital Northern Ireland 2020'.*

Compared to many other nations the UK continues to rate highly with respect to IT investment and utilisation. However, its global ranking has generally declined in recent years and consistently remains below the level assigned to other leading nations, notably the US and the Nordic states in particular (i.e. Sweden, Denmark and Norway). Though the real 'game changers' or those IT firms (e.g. Apple, Google, Facebook etc) attracting the largest valuation all have US roots, which has contributed to the US retaining its place at the top of the IT industry competitiveness index[6]; this could be about to change.

Firms in emerging markets are said to be realising the benefits of ICT investment quicker by learning from their advanced economy counterparts' mistakes and investing aggressively in ICT. Subsequently, questions have been raised about the potential for the IT industry's centre of gravity to shift from West to East – not least because these firms in emerging markets are said to be twice as likely to those in advanced economies to increase such investments by 20% or more[7].

Advancement of economies aside, IT infrastructure remains key to IT competitiveness – seven of the top ten countries according to this measure are also positioned in the top ten of the overall IT competitiveness index. Correspondingly, its absence has been cited for other countries' failures to utilise their large pools of skilled IT employees.

2.2 IT & Telecoms productivity

Since the late 18th century Western society has been described as having experienced five distinct eras or revolutions[8]. Although all are said to have led to profound changes in the organisation of the economy, ICT - which is the fifth and most recent – stands out because of the velocity by which it has changed society.

The IT & Telecoms industry GVA contributes in excess of £0.8 billion to Northern Ireland's economy

The IT & Telecoms industry contributes in excess of £0.8 billion[9] or 1.4% of Northern Ireland's total Gross Value Added (GVA). In addition, across Northern Ireland and the rest of the UK's nations, the previously un-assessed economic contribution of the internet is now said to be worth an estimated £100 billion to the UK economy[10].

If Northern Ireland is to become the world's preferred destination for knowledge economy investment, further investment in ICT is critical. As an

[6] Economist Intelligence Unit 'Investment for the future, Benchmarking IT industry competitiveness 2011', 2011

[7] Oxford Economics, 'Capturing the ICT Dividend', October 2011

[8] World Economic Forum, 'The Global Information Technology Report 2010–2011', 2011

[9] Based on SIC 2003 Codes 72 and 64 – 2007 data

[10] The Boston Consulting Group, 'The Connected Kingdom: How the Internet Is Transforming the UK Economy', October 2010

example of the potential impact investment in ICT can have, the following two paragraphs describe ICT's role in the improved productivity gains realised by the United States (US).

Reports[11] investigating the relationship between the effective application of IT and improved productivity found increased investment in ICT capital to have *'played a major role'* in the doubling of US productivity growth rates - commonly referred to as the *'productivity miracle'*.

Studies to understand the better productivity gains in the United States (US) compared to the UK and the comparative differences across Europe found that US multinational firms are, on average, 8.5% more productive than UK domestic owned firms, and that almost all of this difference is due to the higher productivity impact of their use of ICT[12]. Further research has concluded that over 80% of this productivity advantage is explained by better use of IT and that by 2020, if Europe increased its ICT capital stock to the same level (relative to the size of the economy) as that of the US, GDP would increase by 5% on average – equivalent to €760 billion for Europe as a whole[13].

Notwithstanding the direct economic contribution of the sector, access to technologies, such as the internet, also create social benefits for the 1.8 million people living in Northern Ireland. These include access to employment opportunities for workless adults, improved standards of living for older people and increased democratic engagement and access to information.

2.3 The importance of continued business investment in ICT

The ICT sector, in its own right, clearly offers Northern Ireland continued economic opportunities, but perhaps of equal, if not greater, significance are the opportunities across the rest of the economy arising from businesses in all sectors of the economy maximising their use of ICT, broadband and internet access.

Estimates have been made of the potential GVA and employment impacts likely to result if all businesses, particularly small businesses, fully invest in and optimise advanced ICT. The impacts have been estimated for the UK, the nations, for the English regions and the UK city regions, in each case using a bespoke ICT-impact model first developed by Adroit Economics Ltd for e-skills UK[14].

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[11] London School of Economics, 'The Economic Impact of ICT', January 2010

[12] Office for National Statistics, 'IT investment, ICT Use and UK Firm Productivity' Rafaella Sadun, Shikeb Farooki, Giles Gale, Mark Lever, August 2005

[13] Oxford Economics, 'Capturing the ICT Dividend', October 2011

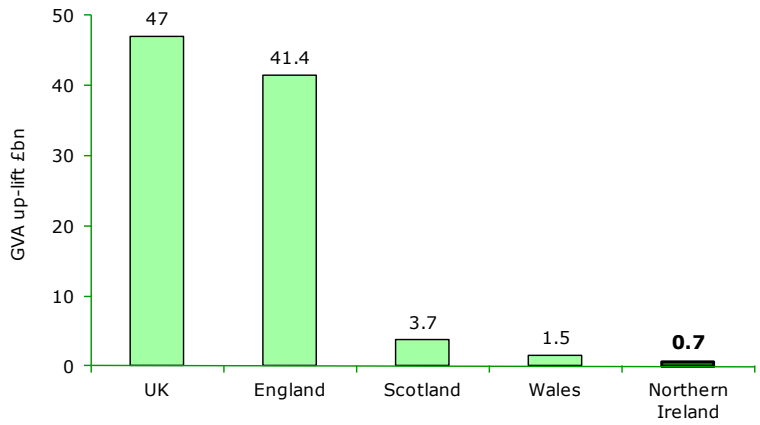
[14] The model was first developed for e-skills UK in 2006/7 and has since been updated in 2010 and now in 2011. The 2011 version of the model estimates potential ICT-driven GVA uplift for each industry sector (using the 2003 Standard Industrial Classification (SIC) system at 2-digit level). The 2011 model calculated potential ICT driven GVA uplift at the level of the UK's nations, the English regions, city regions, and for particular groups of industry sector. ICT GVA uplift is assumed to derive from two factors (i) continued productivity gains and (ii) increased enterprise and innovation. A percentage uplift figure is attributed for each factor and to each industry sector. GVA uplift is calculated by applying the total percentage uplift figure to current GVA for the industry sector (based on Experian's 2012 productivity forecasts)

2.3.1 ICT-driven GVA uplift in Northern Ireland

The 2012 model estimates that optimisation of ICT by businesses could generate an additional £0.7bn GVA to the Northern Ireland economy over the next 5 to 7 years.

Optimisation of ICT by businesses could generate an additional £0.7bn GVA to the Northern Ireland economy over the next 5 to 7 years

Figure 1: GVA uplift in Northern Ireland over the next 5–7 years



Source: Adroit Economics ICT impact model 2012, using Experian 2012 productivity forecasts

2.3.2 Translating the ICT driven GVA uplifts into equivalent jobs in Northern Ireland

Optimisation of advanced ICT by firms will also generate net additional jobs. There is some discussion however regarding the extent of this.

- Some would argue that increased productivity might result in reduced employment in some firms, static employment in other firms and employment growth in others, such that at the level of the economy, ICT driven productivity gains may not translate 100% into additional jobs.
- Others would argue that whilst in the short term, some firms may simply reduce employment, that in the longer term in a vibrant economy it is reasonable to expect advanced ICT to stimulate considerable new business starts and at the level of the economy for any surplus to be taken up by growth.

Recent evidence however strongly suggests that optimisation of ICT will generate significant additional jobs, driven in particular by the emergence of new ICT applications and services that will, in many respects, have a transformational impact on many businesses. In fact, recent studies report that optimisation of cloud computing and of 'big data'[15] alone will create over a quarter of a million jobs in the UK by 2015/17, namely:

- Spend on public and private cloud computing services will create 226,000 jobs in the UK by 2015, according to a study from analyst firm IDC[16] with SMEs adopting cloud computing faster than larger companies saddled with legacy systems.

[15] As the amount of data continues to grow, compounded by the internet, social media, cloud computing and mobile devices, it poses both a challenge and an opportunity for businesses i.e. how to manage, analyse and make use of the ever-increasing amount of data being generated. As a result, organisations are turning to big data analytics solutions such as high-performance analytics to unlock the value of data and reveal previously unseen patterns, sentiments and customer related intelligence

[16] IDC, 'Cloud Computing's Role in Job Creation', 2012

- Harnessing 'big data' could contribute £216 billion to the UK economy and stimulate 58,000 new jobs between 2012 and 2017 according to a new study by The Centre for Economics and Business Research (Cebr) and SAS[17], a leader in business analytics software and services.

These and other fast emerging new IT applications and services are likely to generate significant additional jobs in Northern Ireland.

2.3.3 Equivalent jobs that could be generated in Northern Ireland

The ICT driven GVA uplift of £0.7bn in Northern Ireland economy could translate into 10,000 new jobs, across many occupations and sectors, over the next 5 to 7 years

Calculating the exact number of additional jobs is difficult because many factors are at play. To reflect this, the Adroit Economics model uses several contrasting methods to provide a range of possible job outcomes. The range provides a useful cross-check.

Taking the mid-range as the best guide of the likely number of additional jobs, it is estimated that the ICT driven GVA uplift of £0.7bn in the Northern Ireland economy could translate into 10,000 new jobs, across many occupations and sectors, over the next 5 to 7 years.

Table 1: GVA uplift and estimate of equivalent jobs in Northern Ireland over the next 5-7 years

	GVA uplift £ billion	Estimate of equivalent jobs
England	41.4	427,000
Scotland	3.7	39,000
Wales	1.5	18,000
Northern Ireland	**0.7**	**10,000**
UK	**47**	**494,000**

Source: Adroit Economics ICT impact model 2012, using Experian 2012 productivity forecasts

2.3.4 Social and economic benefits of household use of ICT and of tackling digital exclusion in Northern Ireland

'The total potential economic benefit from getting everyone in the UK online is in excess of £22 billion'

PriceWaterhouse Coopers

It is not only businesses that benefit from use of ICT and access to the internet, citizens and their households also increasingly benefit. The most obvious benefits are entertainment and social benefits (e.g. IP-TV, gaming online, social networking) but there are also economic, educational health and wider quality of life benefits more generally.

An estimated 8.2 million UK adults remain off-line in the UK at present and are missing out on these benefits. The groups subject to the highest digital exclusion are the families with single parents, those aged 65 or over and the unemployed.

Those suffering 'Digital exclusion' will be unable to benefit from the wide and growing range of personal benefits accessing the web brings e.g. improved educational attainment, improved skill levels, improved job level and income, savings from online shopping and better access to public services including health services. Digital exclusion goes hand in hand with social exclusion - the former serves to exacerbate the latter.

[17] The Centre for Economics and Business Research (Cebr) and SAS, 'Data Equity: Unlocking the value of big data', April 2012

A report by PriceWaterhouseCoopers[18] quantified the potential economic benefits that could result from getting everyone in the UK online as in excess of £22 billion.

2.3.5 ICT and significant public service cost savings

Adoption and increased usage of ICT by the public sector in Northern Ireland has and will continue to generate significant cost savings, improvements in existing services and innovative new services in certain areas e.g.

- One of the most significant cost savings derives from customers (businesses and households) accessing information and public services on line and undertaking an ever increasing range of transactions on line. This reduces transaction costs for the public sector whilst reducing time spent and numbers of physical journeys required by customers.
- The health service will also derive savings through reduced GP visits and the improved health enabled by better access to health information and advice online.

2.3.6 The economic importance of super fast broadband

Broadband and access to the internet has become an increasingly vital component of modern life. A recent study of 33 OECD countries by *Ericsson, Arthur D. Little and Chalmers University of Technology, October 2011,* concluded that 'quadrupling of broadband speeds coupled with a 10% increase in penetration would generate an additional 1.6% GVA over a two year period'.

This clearly suggests that faster broadband speeds are integral to the future optimisation and impact of advanced ICT in all countries. It follows that those countries that are able to deploy the best technologies soonest, will gain a competitive advantage.

Further, a recent report by The McKinsey Global Institute[19], reports that the internet is also a catalyst for job creation. Among 4,800 small and medium-size enterprises surveyed, the Internet created 2.6 jobs for each lost to technology-related efficiencies.

'The Internet is also a catalyst for job creation ....with 2.6 jobs created for each one lost to technology-related efficiencies'

The McKinsey Global Institute (MGI)

2.3.7 Ensuring the benefits of ICT are realised in Northern Ireland

This report strongly suggests that adoption and use of ICT continues to have a significant range of positive impacts across the economy for businesses, individuals and for the delivery of Government services.

These impacts are substantial and are of particular importance at this point in time, when priorities are to ensure business growth avoiding a stall in economic recovery, reducing the cost of public services and helping the excluded and disadvantaged to improve their health, aspirations, access to qualifications and work.

What then are the implications of this analysis for future Northern Ireland policy? Is there a need for future ICT policy or will things take care of themselves?

Those countries that are able to deploy the best technologies soonest, will gain a competitive advantage

[18] PriceWaterhouseCoopers 'The Economic Case for Digital Inclusion', 2009

[19] The McKinsey Global Institute (MGI), Internet Matters: The Net's Sweeping Impact on growth, jobs and prosperity, May 2011

The evidence suggests that there is a clear and present need for policy intervention identified in four main areas:

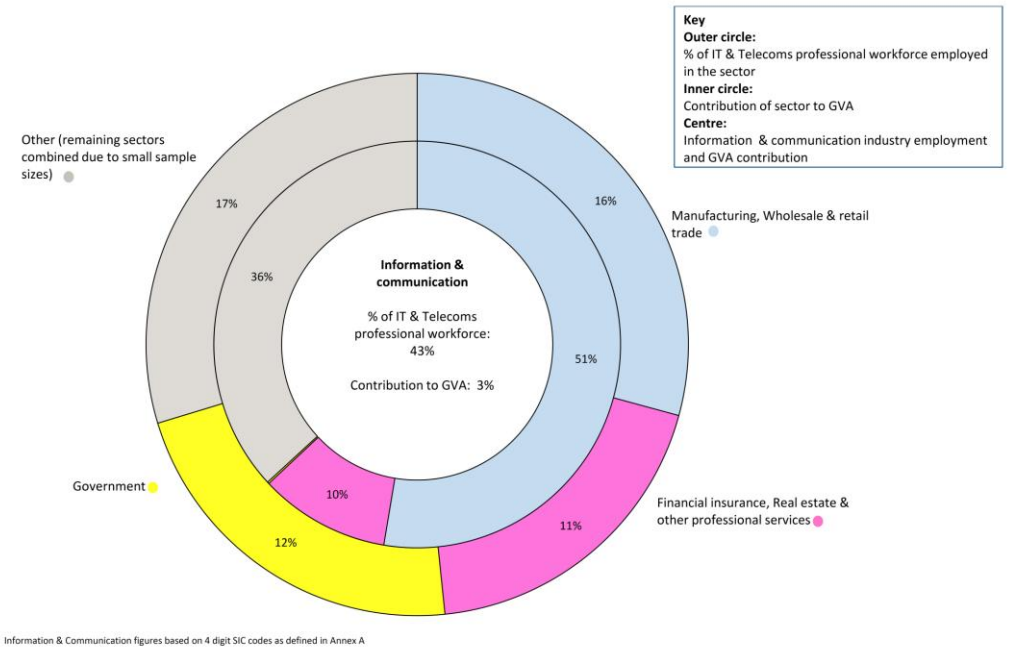
i. ICT business support - helping small businesses in Northern Ireland adopt and exploit more advanced ICT,
ii. Improved ICT skills – both professional and user skills, within the workforce and within communities,
iii. Helping the digitally excluded to access the internet,
iv. Ensuring all of Northern Ireland can access a new generation of superfast broadband.

2.3.8 IT & Telecoms at the heart of the economy in Northern Ireland

Across all industries, it is the combination of highly skilled IT & Telecoms professionals, technology-savvy business leaders and competent IT users that enable an organisation's effective participation in the digital economy.

The following diagram shows the relationship between the proportions of the UK's IT & Telecoms professionals employed across various Northern Ireland sectors, along with their respective GVA contributions, highlighting the role of IT & Telecoms at the heart of the Northern Ireland economy.

Figure 2: The importance of IT & Telecoms to the Northern Ireland economy



Source: e-skills UK analysis of data from the Office for National Statistics (ONS), 2011 data

It is clear that technology related skills are a major factor for economic and social success across many sectors in Northern Ireland, in particular, manufacturing, wholesale and retail, real estate, professional services and within Northern Ireland government.

In Northern Ireland IT is critical not only to the 28,000 people in the IT & Telecoms workforce, i.e. the experts who create, implement and operate the systems, services and communications backbone on which everyone relies; but also the 71,000 business managers who need to have a solid grasp of the strategic implications of technology and the skills to realise its potential together with the many Northern Ireland employees who use IT in their daily work

3.0 Technology's strategic importance in policy

This section summarises the skills and employment related policy environment in Northern Ireland with reference to national economic and skills strategies and other policy developments that impact the sector.

Skills and employment policy context – Northern Ireland

The Northern Ireland Executive's *'Programme for Government'*[20] has five priorities in order to build a peaceful, fair and prosperous society. They are: growing a dynamic and innovative economy; promoting tolerance, inclusion and health and well-being; protecting and enhancing the environment and natural resource; investing in infrastructure; and delivering modern high quality and efficient public services.

Economic strategies

The economy is the top priority in the Programme for Government which is driving for sustainable growth and prosperity, through a dynamic and innovative economy. The UK government is also committed to 'rebalancing the economy' in Northern Ireland[21]. The aim in Northern Ireland[22] is to rebuild the local economy, increasing employment levels and employability, to focus on export-led economic growth to maximise the opportunities for economic recovery and at the same time reduce the historic reliance on the public sector.

'Our vision for the Northern Ireland economy of 2020 is for it to be characterised by a sustainable and growing private sector, with a high-skilled, flexible workforce working in high productivity, innovative firms which compete in global markets.'

NI Executive, Economic Strategy

Skills and education

Skills and education are seen as key to achieving recovery and economic sustainability in Northern Ireland. Improving employability, the level, relevance and use of skills is seen as one of five strategic themes alongside stimulating innovation, R&D and creativity; competing in the global economy; encouraging business growth; and developing economic infrastructure. The Programme for Government sets out the challenge saying, "a successful economy is characterised by high productivity, a highly skilled and flexible workforce and employment growth. We have much to do in terms of building our skills base, increasing prosperity and improving our productivity".

The Northern Ireland Skills Strategy, *'Success through Skills: Transforming Futures'*[23], reiterates that investment in skills is a critical driver for the local economy and for future growth. The skills strategy aims to raise levels of productivity and social inclusion in Northern Ireland. There are four strategic goals which aim to increase skills at each level and, importantly for the IT & Telecoms sector, aim to address subject imbalance through increasing the proportion of graduate leavers from STEM subjects including Computer Science. The strategy identifies the need to: increase higher level skills; up-skill the existing workforce; reduce sectoral imbalances; increase management and leadership skills; and attract skilled labour.

Themes for action include:

- Understanding the demand for skills by: simplifying the skills advisory structure and harnessing labour market information.
- Improving the quality and relevance of education and training through: placements and scholarships; the 'Assured skills' pilot; and a skills delivery model for Matrix.

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[20] Northern Ireland Executive, Programme for Government, 2008

21 HM Treasury, Rebalancing the Northern Ireland economy, March 2011

[22] DETI, Northern Ireland Executive Economic Strategy: Consultation on priorities for Sustainable growth and prosperity, January 2011

[23] Department for Employment and Learning, Success through Skills: Transforming Futures, May 2011

- Improving productivity by increasing the skill levels of the workforce through: expanding Foundation Degrees; the 'Skills Solutions' service; accreditation of prior experiential learning; increasing skills in certain subject areas; a framework for management and leadership provision; skills utilisation; recognising more training by companies and by attracting skilled people to Northern Ireland.
- Tackling the skills barriers to employment and employability by: helping to address skills barriers to work, retention and progression; and employability skills.
- Engaging stakeholders through marketing and skills collaboration.

In terms of reducing sectoral imbalances, both the Skills Strategy and the report of the STEM review[24] acknowledge that the future economy will be increasingly dependent on STEM skills but the numbers of young people choosing to study these subjects in Northern Ireland has been falling. The need for greater emphasis on STEM subjects including Computer Science is reiterated in the consultation on developing a Higher Education Strategy[25] and in the identification of the IT & Telecoms sector as a priority sector by the Northern Ireland Skills Advisor[26] in order to inform choices, decisions and investment and to align provision to drive business and employment growth.

Furthermore, the importance of ICT as an Essential Skill is highlighted throughout the skills strategy in respect of tackling the barriers to employment and improving the skills profile.

Other policy developments

Other developments of relevance to the sector in Northern Ireland include:

- Digital Northern Ireland 2020 (DNI2020)[27]. Supported by Invest NI DNI2020 is part of the collaborative network and exists to promote and exploit the benefits of a digital platform for the Northern Ireland economy, maximising economic growth, improved quality of life and social uplift life for all citizens. By the end of this decade, DNI2020 aims for Northern Ireland will be the world's preferred destination for knowledge economy investment.
- The Telecommunications Action Plan for Northern Ireland 2011-2015[28] which considers investment to ensure availability of broadband services across NI, increase superfast broadband, strengthen international telecoms links and increase demand for services. Government is working with the Telecommunications industry to implement key infrastructure projects.
- MATRIX, the science industry panel in Northern Ireland, identifies the Information and Communication Technology (ICT) sector as essential for the future growth of the knowledge based economy in Northern Ireland. The Department for Employment and Learning have committed to facilitate the development of the skills necessary for emerging market opportunities and to develop a skills delivery model.

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[24] Department of Education, Report of the STEM review, September 2009

[25] Department for Employment and Learning, Consultation document on the development of a Higher Education Strategy for Northern Ireland, January 2011

[26] Northern Ireland Advisor on Employment and Skills, Identification of Priority Skill Areas for Northern Ireland, March 2011

[27] http://www.dni2020.com/about-dni2010 Accessed 31.10.11

[28] Department of Enterprise, Trade and Investment, A Telecommunications Action Plan for Northern Ireland 2011-2015 Consultation, 7 March 2011

e-skills UK strategic response

e-skills UK has a Strategic Plan for Northern Ireland (2010-2014) that, based on research input from employers, sets out a coherent suite of skills strategies that enable the economy to derive maximum benefit from the power of technology; transforming competitiveness and productivity through the creation of appropriate technology related skills.

e-skills UK is undertaking work to support three strategic objectives:

- **Inspire future talent** by motivating students to pursue IT-related careers and better prepare all young people for work in a technology-enabled world,
- **Support IT professionals** by developing the IT professional skills pool as the best in the world for delivering business benefit from technology,
- **Increase digital capability** by triggering increased investment in the IT capability of all individuals and businesses in every sector.

Actions detailing how e-skills UK will deliver these objectives are set out in the plans with specific activities tailored to the context of Northern Ireland. The strategic plans for each nation and the associated actions will be further informed by the research presented in this suite of *'Technology Insights 2012'* publications.

4.0 IT & Telecoms: underpinning Northern Ireland's employment

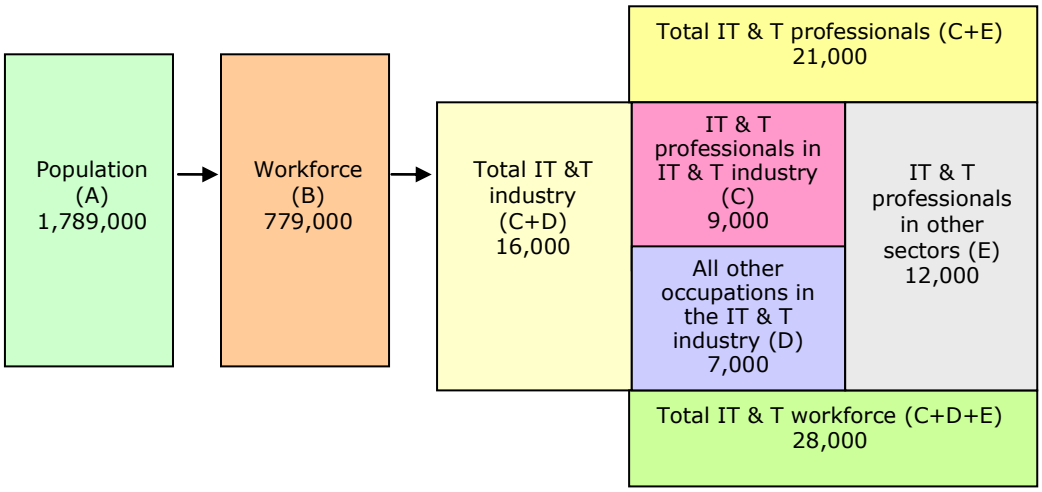
The smallest of the UK nations, Northern Ireland represents just 3% of the total population, workforce, and business establishments in the UK. GVA per head in Northern Ireland is significantly lower than other nations and regions (at 79% of the UK average) as are average rates of pay (88% of the average).

There are more than 1,500 workplaces in Northern Ireland's IT & Telecoms industry - 77% of which are IT and 23% Telecoms. 74% of these are services orientated. Across Great Britain, though micro firms make up 93% of the number of IT & Telecoms workplaces, they employ just 28% of the sector workforce. By contrast, companies with 200 or more employees make up less than 1% of the number of workplaces but employ the largest proportion (34%) of the workforce.

There are more than 1,500 workplaces in Northern Ireland's IT & Telecoms industry

In terms of its workforce, there are 28,000 people (or one in every twenty fifth person working in Northern Ireland) employed in IT & Telecoms – 16,000 (57%) of which work in the IT & Telecoms industry itself with a further 12,000 (43%) working as IT or Telecoms professionals in other industries. The following diagram segments IT & Telecoms professionals and the IT & Telecoms industry. In addition it shows which of their respective sub groups combine to form the IT & Telecoms workforce.

Figure 3: IT & Telecoms workforce – high level segmentation



Source: e-skills UK analysis of the ONS Labour Force Survey, 2011 four quarterly average

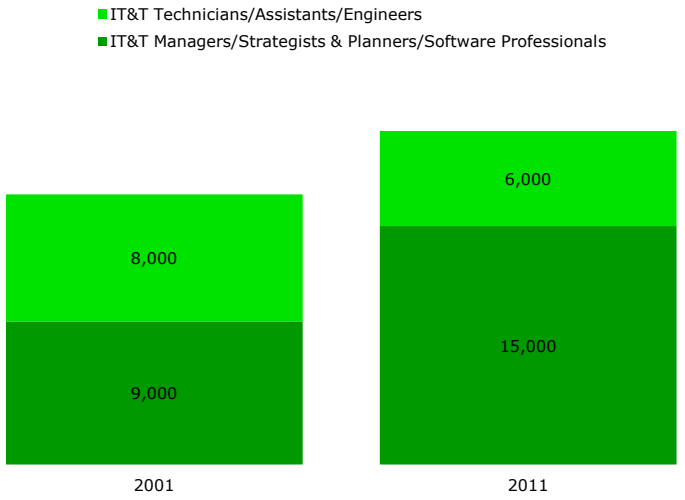
Note: Figures may not add up due to rounding

4.1 Occupational profile

In Northern Ireland in 2011 nearly three quarters (71%) of IT & Telecoms professionals worked in either managerial, strategic or software roles with the large proportion of these (69%) employed as Software Professionals.

Analysis of Northern Ireland's employment trends in Figure 4 for IT & Telecoms professionals over the last ten years shows a significant increase in the number of these higher level roles, increasing by 67% in this period. By contrast, those in IT & Telecoms Technician/Assistant/Engineering roles have decreased by a quarter (25%).

Figure 4: Number of IT & Telecoms professionals by occupation in Northern Ireland 2001 to 2011

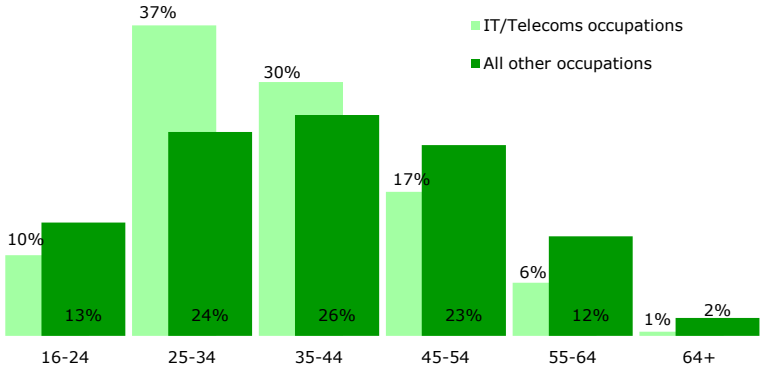


Source: e-skills UK analysis of data from the ONS Labour Force Survey, 2011 (four quarter average)

4.2 Age and gender

Looking at the age composition of the IT & Telecoms professional workforce in Northern Ireland reveals, as for the UK as a whole, the proportion of 'young people' (those aged 16-24) working as IT & Telecoms professionals in Northern Ireland is notably lower than that for workers in other occupations (i.e. 10% and 13% respectively). Though the differential is not as large as in other UK nations it should be noted that, across the UK, the proportion of young people working in IT & Telecoms roles has been in decline for a number of years giving rise to concerns about the potential availability of entry grade positions for those considering a career in IT & Telecoms.

Figure 5: Age distribution of IT&T professionals/ other workers in Northern Ireland



Source: e-skills UK analysis of data from the ONS Labour Force Survey, 2007-11 (average over the period)

This hypothesis is supported to some degree by an analysis of employment trends over the past decade which shows how growth in more senior IT & Telecoms positions (i.e. Managerial/Professional) has coincided with a decline in lower level posts (i.e. Technicians/Engineers) – these being the most likely points of entry for young people seeking to commence a career in IT & Telecoms.

Gender also remains a significant issue - just 25% of IT & Telecoms professionals in Northern Ireland are female. By comparison, across all other occupations in Northern Ireland, females account for around half of the workforce.

5.0 The changing environment

This section gives an overview of issues facing businesses in the UK and Northern Ireland together with a summary of key trends and associated skills implications.

When asked about their level of concern over various business influencers, employers across the UK surveyed in 2011 by the National Skills Academy for IT clearly highlighted the state of the global and national economies as being the most pressing issue for them.

Though labour issues were not generally a major concern for UK firms, the level of concern relating to the availability of skilled IT & Telecoms staff was twice the level amongst IT and Telecoms employers than that recorded by UK businesses as a whole (i.e. with 'concern ratings' of 0.8 and 0.4 respectively).

In Northern Ireland specifically whilst business optimism is, on balance, positive, it is down on previous years driven largely by increasing concern in IT & Telecoms companies. The major concerns for businesses are: the state of the global economy; national/government debt; and the availability of business credit. Despite these issues, over half of all Northern Ireland companies expected productivity, turnover and sales to increase over the course of 2012. Even with continued concerns over the economy, over half of all companies surveyed for the ICT Snapshot[29] in Northern Ireland were predicting an improvement in productivity, turnover and sales over the coming year coupled with a predicted increase in the development of new products and services.

5.1 Emerging trends and associated skills needs

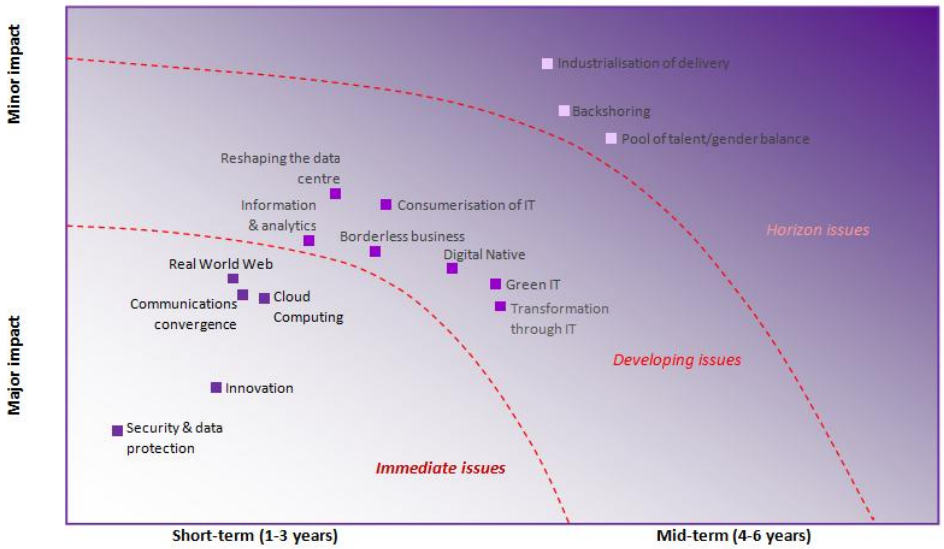
Figure 6 illustrates the relative impact of each key trend on business according to employers who were asked how significant the impact of each trend would be on their business, and if there was an impact, what the broad timescale would be. Based on these results the trends are categorised into one of three groups:

- Immediate issues: Those that many (typically more than half) employers say will have a major impact on business, and typically in the next one to three years. The immediate key issues for employers appear to be security and data protection, but innovation is also considered important, followed by cloud computing, convergence of communications & IT and the real world web,
- Developing issues: Those that will have a major impact on only a selection of businesses, or alternatively may have a more widespread impact, but in the medium term. 'Developing' does not necessarily mean new – some of these issues have been around for some time, for example green IT and the transformation of businesses using IT, but it can take time for the impact to be felt. Other issues are new, for example the possibility of reshaping the data centre has emerged in the last five years, but only those businesses with intensive computing needs will be directly affected,
- Horizon issues: Wider, ongoing issues, impacting at different times, on different businesses, but not affecting a majority of businesses all at once. For example, quite a few large businesses are thinking about back-shoring, but it is not regarded as an immediate issue and smaller employers do not appear to be very concerned by it. In contract, industrialisation of IT delivery will only really impact on small employers in any great number, while the pool of talent and gender balance appears more of an issue for IT & Telecoms businesses than other employers of IT & Telecoms professionals.

The most immediate key issue for employers is security and data protection

[29] A yearly e-skills UK publication commissioned by DEL/Invest NI providing a dedicated source of information about ICT labour and skills in Northern Ireland

Figure 6: Trends shaping IT & Telecoms skills changes



Source: Technology Insights 2011: Trends and UK Skills Implications, e-skills UK/Experian

5.2 Future skills issues

Many of the future trends that affect IT & Telecoms utilise similar technologies and or require similar skills and knowledge. There are five cross cutting themes in the demand for skills that emerge across the future trends survey and the relationship between skills and trends is shown in figure 7, below.

Figure 7: Future IT trends and the cross cutting skills issues

	Security skills	Business skills	Technology specific skills	Interpersonal skills	Analytical/research skills
Security and data protection	●		●		○
Innovation		●		○	○
Cloud computing	●	○	○	○	
Transformation through IT		●	●	○	
Real world web		○	●	○	
Convergence of IT & communications	●	○	●		
Borderless Business	●		○		
Digital Native		○	○	○	○
Reshaping the Data Centre	○	○	○	○	
Green IT			●		○
Information and analytics			●		●
Consumerisation of IT		○	○	○	
Back-shoring	○	○		○	
Pool of talent/gender balance		○	○	○	
Industrialisation of IT delivery		○	○	○	

●	Priority skills requirement (>67% of respondents say will be required)
○	General skills requirement (<67% of respondents say will be required)

Source: IT & Telecoms Insights 2011: Trends and UK Skills Implications

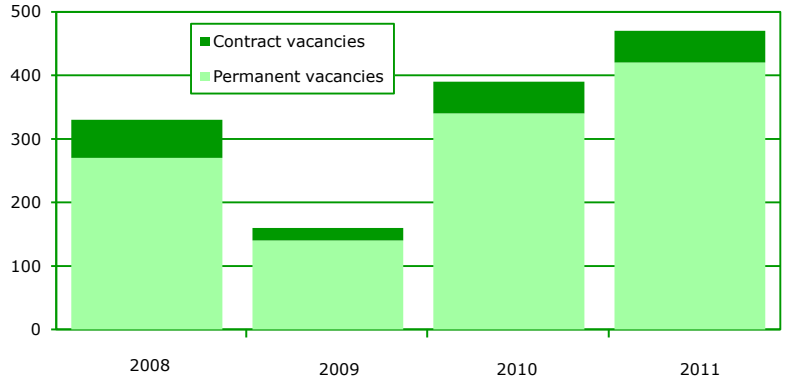
6.0 Current and future recruitment into IT & Telecoms

This section explores IT & Telecoms workforce growth and replacement dynamics, recruitment needs by occupation, and recruitment sources. The general demand figures contained within this section are drawn from a bespoke analysis of vacancy data from Salary Services Ltd whilst observations regarding recruitment difficulties and skills shortages have been obtained from the National Academy for IT.[30]

6.1 Demand for IT & Telecoms professionals

There were approximately 500 advertised vacancies for IT & Telecoms professionals in Northern Ireland during each quarter of 2011, the majority of which (88%) were for permanent posts.

Figure 8: Change in demand for IT & Telecoms professionals 2008-2011[31]



Source: e-skills UK analysis of data from Salary Services Ltd

As within the UK as a whole, the majority of adverts for IT & Telecoms positions in Northern Ireland were in the areas of Development, Design or Support (65%, 11% and 12% respectively) and these groups have accounted for an increasing proportion of advertised vacancies over each of the past three years (growing from 77% in 2008 to 88% in 2011).

For each of the vacancies advertised, a range of generic skills and competences are required together with a variety of job specific, technical skills - the most commonly requested in 2011 being (in order of demand volume): SQL, .NET, Java, C#, C++, CAD, SQL Server, Unix, ASP and HTML.

In January 2012 specific results from the Northern Ireland ICT Snapshot Survey showed that 12% of all and 14% of IT & Telecoms companies in Northern Ireland had vacancies for one or more IT/Telecoms professionals. Additionally of those companies with vacancies just under half (46%) are looking for Software Developers which also comprise the highest number of vacancies by occupation.

Of those companies with vacancies just under half (46%) are looking for Software Developers

Amongst recruiters of IT & Telecoms staff across the UK as a whole however, just under one in seven (14%) reported having difficulties filling the positions advertised during 2011, and of these, a similar proportion (15%) stated that they were experiencing IT & Telecoms related skills shortages (i.e. a lack of applicants with the required skills, qualifications or experience required).

Problems relating to the recruitment of IT & Telecoms professionals were more common amongst larger firms and those operating within the IT &

[30] 2011 Employer survey

[31] Four quarter average

Telecoms sector where IT & Telecoms related skills shortages were also more often reported.

IT & Telecoms related skills shortages across the UK tended to be associated with vacancies at 'professional' level (i.e. as opposed to managerial, technician or engineer grade) and in particular: Programmers/ Software Developers and Web Design/Development professionals.

The technical skills most often cited by UK employers as being hard to find amongst applicants for skills shortage vacancies tended to be: .NET/ASP.NET, Dynamics, Sharepoint, Visual Basic/Visual Studio and C# together with PHP and VMWare[32].

By far the majority (76%) of employers in Northern Ireland[33] were of the view that there will be no change in the degree of ease/difficulty associated with filling IT & Telecoms vacancies over the coming 12 months.

Though this view was common to the majority of firms in the UK, those predicting that it would be harder to recruit IT & Telecoms staff were most likely to see problems arising when recruiting for Programming and/or Software Development positions.

6.2 IT & Telecoms workforce growth dynamics

Work during 2011 with the forecasting experts Experian identified that the growth of the IT professional workforce in Northern Ireland is predicted to continue strongly to 2020. While employment in the overall Northern Ireland workforce is forecast to increase at 0.72% per annum to 2020, the IT professional workforce within the IT industry is forecast to grow at 2.16% per annum, three times as fast as the average employment growth in Northern Ireland.

Employment of IT professionals within the IT industry to 2020 is forecast to grow at 2.16% per annum –three times as fast as the Northern Ireland average.

Table 2: Forecast annual average employment growth rates per annum in Northern Ireland 2011-2020

	Growth per annum (%)
IT professionals	2.01%
IT professionals within the IT industry	2.16%
IT professionals in all other sectors	1.91%
The IT industry	0.07%
All other occupations within the IT industry	-1.84%
Telecoms professionals	1.10%
The Telecoms industry	0.96%
Northern Ireland workforce: all sectors	0.72%

Source: e-skills UK analysis of Experian employment forecasts 2011

Whilst growth within the IT industry overall has slowed significantly from previous forecasts, brought about predominately by a reduction across IT organisations of non IT staff, (showing an average forecast decline of 1.84% per annum to 2020), employment growth in the Telecoms industry is predicted to grow at 0.96% per annum, improving upon a previous forecast decline of 0.35%.

Growth in the IT & Telecoms professional workforce is expected to be almost solely amongst the more senior level / high value roles i.e. ICT Managers, IT Strategy & Planning and Software Professional roles whilst the number of people employed in lower skilled roles will increase only slightly as shown in Table 3, below.

[32] Treat with caution very small number of responses

[33] Employers already with IT & Telecoms staff

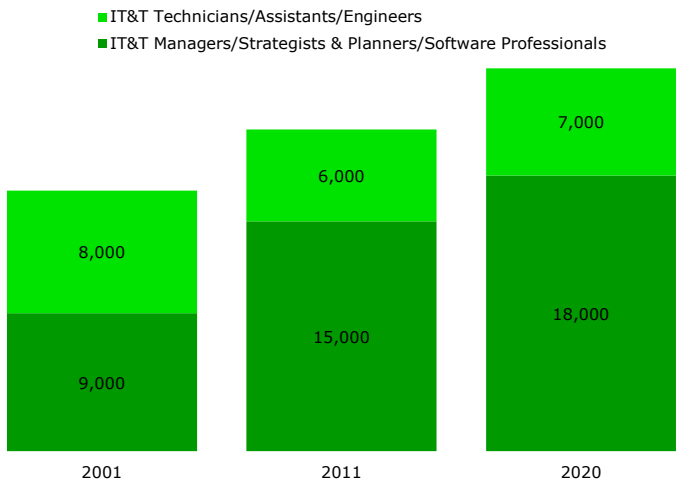
Table 3: Number of IT & Telecoms professionals in Northern Ireland by occupation 2011-2020

	Employment					
	2011		2020		Average annual growth	Growth 2011-2020
	n	%	n	%	%	n
ICT Managers/IT Strategy & Planning Professionals/Software Professionals	15,000	70%	18,000	73%		3,000
IT Operations Technicians/ IT User Support Technicians/ Database assistants/ Telecoms Engineers/ Line Repairers and Cable Jointers/ Computer Engineers	6,000	30%	7,000	27%		1,000
Total	**21,000**		**25,000**		**1.93%**	**4,000**

Source: e-skills UK analysis of data from the ONS Labour Force Survey, 2011 (four quarter average) together with 2011 forecasts from Experian.

Figure 9, below, combines the actual changes in the occupational profile of the Northern Ireland IT & Telecoms professional workforce from 2001 to 2011 (from chapter 4) with the forecasts by occupation through to 2020. Highest growth rates of IT & Telecoms occupations are forecast to be in the higher value roles.

Figure 9: Number of IT & Telecoms professionals by occupation in Northern Ireland 2001, 2011 and forecast to 2020



Source: e-skills UK analysis of data from the ONS Labour Force Survey, 2011 (four quarter average) together with 2011 forecasts from Experian

It is also useful to see which sectors of the Northern Ireland economy are forecast to employ the largest proportion of IT & Telecoms professionals by 2020. Table 4, below, shows the top twenty sectors employing the highest numbers of IT & Telecoms staff.

Table 4: Forecast percentage of Northern Ireland's IT & Telecoms professional workforce by sector in 2020

Sector	% of IT & Telecoms professionals in 2020 (% of total)
Computer/related activities	27.48%
Other Business Activities	9.45%
Post & Telecommunications	8.50%
Public Administration & Defence; Compulsory Social Security	7.32%
Construction	6.37%
Financial Intermediation, (excl Insurance & pension funding)	5.54%
Education	5.25%
Health & Social Work	3.89%
Retail Trade, Except of Motor Vehicles & Motorcycles, Repair of Personal & Household Goods	3.42%
Wholesale Trade & Commission Trade, Except Motor Vehicles & Motorcycles	2.77%
Financial Intermediation (auxiliary activities)	2.60%
Transport Activities of Travel Agents (supporting & auxiliary)	1.64%
Recreational, Cultural & Sporting Activities	1.58%
Publishing, Printing & Reproduction of Recorded Media	1.49%
Electricity, Gas, Steam & Hot Water Supply	1.19%
Research & Development	1.00%
Manufacture of Medical, Precision & Optical Instruments, Watches & Clocks	0.84%
Manufacture of Machinery & Equipment Not Elsewhere Specified	0.81%
Manufacture of Radio, Television & Communications Equipment & Apparatus	0.72%
Manufacture of Other Transport Equipment	0.67%

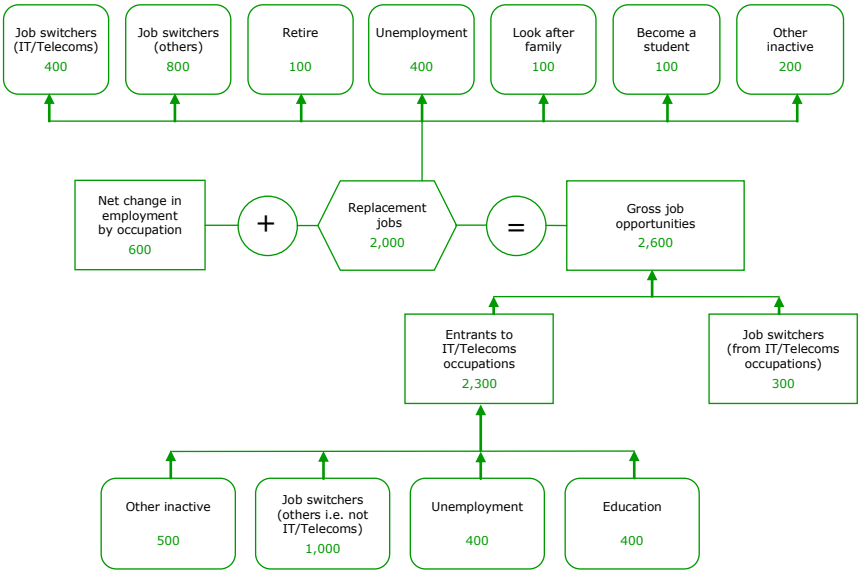
Source: e-skills UK analysis of Experian employment forecasts, 2011

Computer/related activities (the majority of Northern Ireland's IT industry) will continue to account for the largest proportion of IT & Telecoms professionals working in 2020 whilst 'Other business activities' (which includes the likes of legal, accounting and business and management consultancy) has a significantly higher proportion of IT & Telecoms staff than most other sectors. Post and Telecoms (SIC 64) and Public Administration (SIC 75) together account for nearly 16% of Northern Ireland's IT & Telecoms professional workforce with Construction and Financial Intermediation forecast at 6.37% and 5.54% respectively.

6.3 Recruitment needs

Figure 10 shows there are 2,600 gross job opportunities expected each year between up to 2015 across all IT & Telecoms occupations. Replacement accounts for the vast majority of these opportunities with 2,000 jobs (or 77%) expected to become available due to one of the replacement factors[34].

Figure 10: Anticipated annual gross job opportunities for IT & Telecoms professionals to 2015 in Northern Ireland



Source: Experian/e-skills UK analysis of gross job opportunities, 2011

Through to 2015 there is a need for 2,300 new entrants a year into IT & Telecoms professional job roles. Based on current data, the makeup of this intake is expected to be as follows:

- 1,000 people a year coming from occupations other than IT or Telecoms (i.e. experienced workers who can be re-trained as IT & Telecoms professionals),
- 400 people a year coming from education (predominantly graduate level and higher),
- 900 people a year coming from other sources (e.g. re-entering the workforce after a career break, early retirement or unemployment).

2,300 new entrants a years are required to fill IT & Telecoms professional job roles in Northern Ireland

[34] Job switcher numbers only reflect the position at the end of a year compared with that at the start and do not take account of job movements within the IT & Telecoms professional workforce taking place throughout the year

7.0 Current and future workforce development

This section looks at the level of skills held by IT & Telecoms professionals working in Northern Ireland[35], the likely degree to which they match with those needed by employers and the steps taken by individuals/employers to address mismatches and ensure future balance between the skills held by/needed of IT & Telecoms staff. The analysis is based primarily upon the findings of a recent survey of employers carried out on behalf of the National Skills Academy for IT (2011) alongside a bespoke analysis of data from the Office for National Statistics (ONS) quarterly Labour Force Survey[36].

On average, IT & Telecoms professionals working in Northern Ireland are educated to a much higher level than other workers, with 70% holding an HE level qualification in 2011 compared with just 32% of those working in other occupations. Levels of educational attainment amongst IT & Telecoms staff in Northern Ireland are also well above the UK average (62%) though the converse was found to be true for those working in other occupations (32% being educated to HE level in Northern Ireland compared with 37% in the UK).

Educational attainment is also higher amongst IT & Telecoms industry workers in Northern Ireland than those in other sectors (with comparison figures of 64% and 32% respectively). once again these workers tend to be more highly educated than their counterparts working in the UK (where 59% of IT & Telecoms industry workers hold a qualification at this level).

Though specific data for Northern Ireland are not available it appears that for the UK as a whole, both IT & Telecoms professionals and IT & Telecoms industry staff working at 'professional' grades (i.e. SOC level 2[37]) have a much lower level of educational attainment than their counterparts at this level in non IT/Telecoms roles and/or sectors.

Results from the Northern Ireland ICT Snapshot survey (January 2012) identify that 26% of all companies with IT staff are aware of gaps in the skills of these employees. These firms also report areas for skill improvement as being: Technical skills (78% of firms with skills gaps); Sector knowledge/experience (63%); Business skills (55%); Interpersonal skills (37%) and Leadership skills (29%). Firms in Northern Ireland report skills gaps tend to cause an increase in workload for other staff and lead to outsourcing.

Similarly the results across the UK show that where they are apparent, skills gaps amongst IT & Telecoms professionals are likely to be both of a technical and non-technical nature and will often arise with respect to: sales/related, interpersonal and business/related skills (i.e. non-technical) along with ASP.NET, C,.NET, PHP and Linux (technical).

Most recent estimates[38] suggest around 48% of IT & Telecoms professionals working in the UK will receive some form of job-related education/training each year compared with 51% of workers in other occupations. Figure 11 identifies that around 25% in the UK received education/training each quarter during 2011 – this being significantly above the proportion receiving education/ training in Northern Ireland at that time (18%[39]).

Across the UK, IT & Telecoms Engineers appear most likely to receive job-related education/training with around 31% doing so each quarter. Conversely, development activity is lowest amongst IT & Telecoms Assistants (with a comparison figure of just 14%).

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[35] As data for Northern Ireland is of limited availability, UK figures are often used as a proxy and text within this section should be considered as UK wide unless otherwise specified

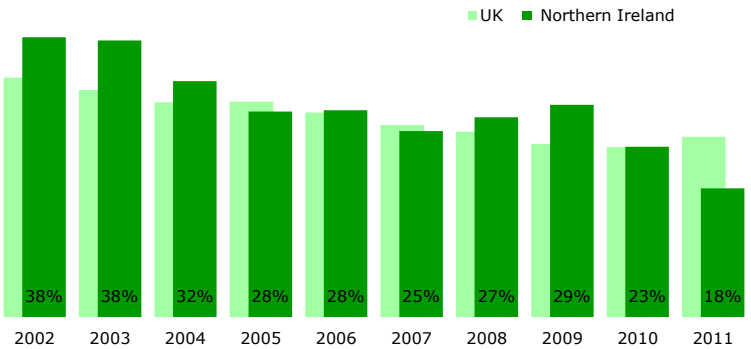
[36] Using four quarter annual averages

[37] See Annex A

[38] 2010

[39] Figure based on an eight quarter average over the 2010-2011 period

Figure 11: Percentage of IT & Telecoms professionals receiving job related education/training each quarter



Source: e-skills UK analysis of data from the ONS Labour Force Survey

Notes: UK figure based on a four quarter average whilst the figure for Northern Ireland is averaged over eight quarters due to small survey sample size

For those working in 'professional' level positions (IT & Telecoms Strategy, Planning and Development) the percentage receiving education/ training was similar to the overall average for all IT & Telecoms staff though it was significantly below the level for other, non-IT & Telecoms workers employed at this level/grade (i.e. 23% vs. 41% respectively).

Of the IT & Telecoms professionals that do not receive education/ training each quarter in the UK, almost one quarter (24%) are thought to have received an offer of education/training from their employer though it is likely that the proportion is much lower amongst IT & Telecoms professionals working in Northern Ireland[40].

[40] Caution low bases

8.0 IT related education and qualifications

Please see Annex D for additional supporting data.

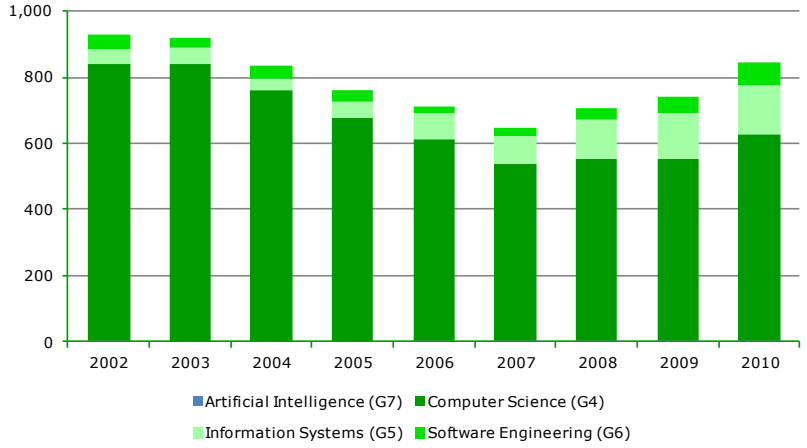
8.1 Higher Education

IT related Higher Education remains an important source of talent for the sector's labour force requirements. Across the UK, a key issue affecting undergraduate provision has been the large decrease in numbers of applicants to IT related courses. Influenced by a number of factors and despite a 42% resurgence from 2007 to 2010, the number of applicants (UK domicile) to such courses in Northern Ireland has declined by 13% since 2002. By comparison, the total number of applicants (UK domicile) to all HE courses in Northern Ireland has increased by 26% over the 2002-2010 period.

The number of people applying to IT related HE courses in Northern Ireland has increased by 42% from 2007 to 2010

Acceptances onto IT related Higher Education courses in Northern Ireland declined over the 2002 to 2007 period but increased from the 2007 low of 645 to 845 in 2010. Across all IT related HE courses in 2010, 80% of acceptances were male and 20% were female.

Figure 12: Acceptances onto IT related HE courses in Northern Ireland, 2002-2010, UK domicile



Source: e-skills UK analysis of data from UCAS

The number of UK domiciled IT related and Telecoms qualifiers from Higher Education Institutes (HEIs) in Northern Ireland increased by 2% from 2008/09 to 2009/10 compared to the UK as a whole, which decreased by 2%.

8.2 Further Education

In 2004/05 there were more than 22,000 enrolments onto IT & Telecoms professional and IT user Further Education courses in Northern Ireland. By 2009/10 this figure had fallen to just over 12,000 – a decline of 45%. Of the IT & Telecoms related enrolments in 2009/10 (7% of total enrolments across all subjects), 33% were at level 1 and entry, 30% at level 2 and 37% at level 3+.

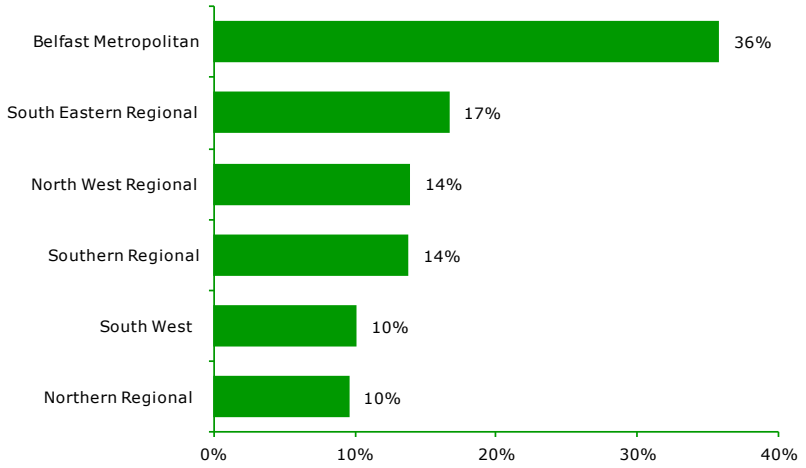
Of those (of all ages) taking IT & Telecoms related courses in Northern Ireland in 2009/10, 56% were male and 44% were female. The proportions also vary significantly according to age group. 72% of those aged 19 or under taking such courses were male. The gender gap narrows to 31 percentage points for those aged 20-24 yrs old and the once male dominance is reversed by the time people taking such courses reach 25+ years old, where 55% of enrolments were from females.

Of the 6 colleges in Northern Ireland delivering IT & Telecoms related Further Education courses in 2009/10, Belfast Metropolitan delivered over a

third (36%). Other notable colleges include South Eastern Regional (17%), North West Regional and Southern Regional (both 14%).

It is a similar story across all subjects, with Belfast Metropolitan delivering the highest proportion of courses (26%).

Figure 13: Enrolments onto IT & Telecoms related subject areas by college, 2009/10



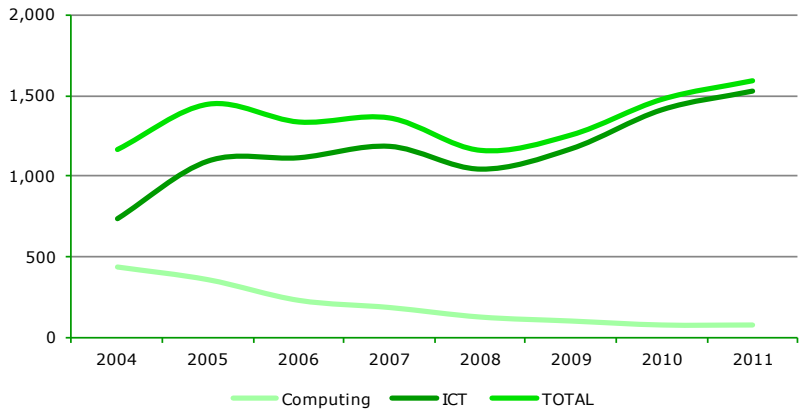
Source: e-skills UK analysis of data from DELNI

8.3 Schools and Colleges

Uptake of IT related A-levels increased by 8% in the past year

In contrast to the UK as a whole, the number of students in Northern Ireland taking an IT related A-level has increased by 8% during the past year, influenced wholly by the uptake of A-level ICT rather than A-level Computing where uptake in Northern Ireland has continued to decline. Across the UK the number taking an IT related A-level has declined by 2%.[41]

Figure 14: A-level uptake of Computing and ICT, 2004-2011



Source: e-skills UK analysis of data from the Joint Council for Qualifications

[41] Data has been analysed for Computing and ICT A-Levels and not for Applied A-Levels. Computing A-Level sets out to develop a broad range of specialist skills and knowledge relating to IT. ICT instead sets out to encourage students to be 'discerning users of ICT'. Broadly speaking these are, equivalent to 'IT professional' and 'IT user' related qualifications and the content of the Computing A-Level is more relevant to IT related Higher Education and IT related employment than A-Level ICT

Considering GCSE level education in Northern Ireland, there are a number of courses, including a GCSE in ICT, a GCSE double award in Applied ICT, and a short course GCSE in ICT. Whilst numbers taking IT related GCSEs across the UK declined by 69% from 2005 to 2011, numbers in Northern Ireland grew by more than a third (35%). The total IT related GCSEs sat as a percentage of all GCSEs sat has remained static at 5% over the past three years.

8.4 Gender

The table below shows a varied picture in relation to gender balance across all levels of education. It is interesting to note that whilst A-Level ICT shows a positive increase of female participation from 2003 to 2011, A-Level Computing shows a decline of 16 percentage points in Northern Ireland over the same period.

Table 5: Gender balance on IT related courses and in IT & Telecoms professions

	Qualification	% of females 2005	% of females 2011	Variance
Northern Ireland	ICT (Full Course) GCSE	40%	44%	4%
UK	ICT (Full Course) GCSE	43%	45%	2%
Northern Ireland	A-level Computing	25%	9%	-16%
UK	A-level Computing	11%	8%	-3%
Northern Ireland	A-level ICT	44%	55%	11%
UK	A-level ICT	35%	39%	4%
Northern Ireland	Applicants to Computing discipline degree courses, UK domicile	21%	20%*	-1%
UK	Applicants to Computing discipline degree courses, UK domicile	14%	12%*	-2%
Northern Ireland	IT & Telecoms professional occupations	28%	26%	-2%
UK	IT & Telecoms professional occupations	20%	18%	-2%

Source: e-skills UK analysis of data from UCAS, Department for Education, Joint Council for Qualifications and the ONS Labour Force Survey

Note: * 2010 data

9.0 The wider population's use of IT

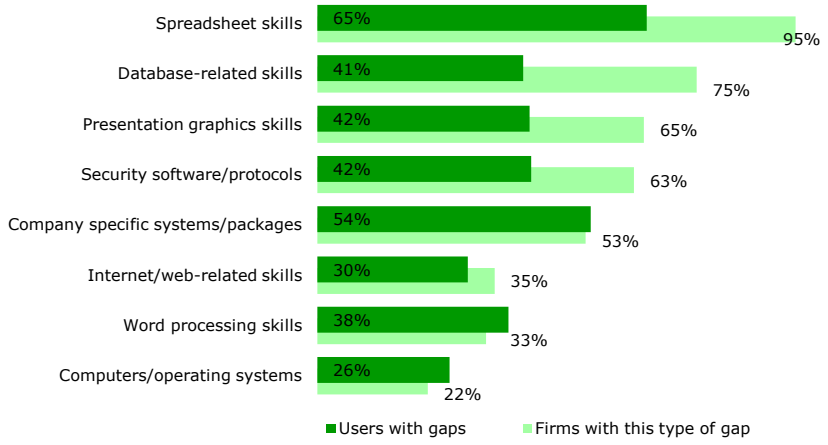
This section looks at the general levels of IT usage in Northern Ireland and the level of IT skills held by the workforce. A variety of sources are referenced to in this section including the Office for National Statistics (ONS) *Internet Access - Households and Individuals survey (2011)*[42], the Department for Business, Innovation and Skills (BIS) *Skills for Life Survey (2011)*[43] and the 2011 employer survey commissioned by the National Skills Academy for IT. [44]

Latest UK estimates from ONS suggest that around 87% of people aged 16 or over have used a computer at some time in their lives and that many have used them to undertake a wide range of activities including computer programming.

IT users are likely to have developed their e-mail related skills to a higher level than other IT skills such as word-processing/spread sheets which are most often held at just NVQ entry level 3 or below (compared with NVQ level 2 for emailing/related skills).

Results from the 2011 employer survey carried out by the National Academy for IT for, show around one in six (16%) employers in Northern Ireland were aware of gaps in the skills of their employees whilst, within the UK at least, around 42% of firms with skills gaps were also thought to have gaps in the skills of their IT users.

Figure 15: Incidence of computer users with gaps in their IT skills, by nature of skills gaps



Source: National Skills Academy for IT - Employer survey, 2011

Gaps were most often thought to exist in the spreadsheet skills held by computer users and virtually all firms (95%) with IT user skills gaps identified a mismatch in this area. Moreover, amongst computer users employed within these firms, almost two thirds (65%) were thought to have skills gaps of this nature.

On average, just under one quarter (24%) of companies reporting gaps in the IT skills of their computer users were of the view that staff were underperforming as a consequence and on average users with gaps in their IT skills were thought to be working at 78% of their full potential.

[42] Figures relate to Great Britain only as opposed to the UK as a whole

[43] Figures relate to England only as opposed to the UK as a whole

[44] Due to the sample sizes involved much of the data provided by these sources is available at UK level only and as such charts and commentary within this section tend to employ national data as a proxy indicator for ICT developments within Northern Ireland. Where data for Northern Ireland is available it has been specifically highlighted within the associated part of the report.

Despite the potential impacts of IT skills gaps on business activities, gaps were thought to have been in existence for 6 months or longer in around half of the cases reported (47%) even though they were often thought avoidable (in 48% of cases) – particularly via the implementation of more training.

There is little data available on the incidence / nature of IT user skills training provided by UK firms though the ONS *Internet Access survey of Households and Individuals, 2011* does show that; amongst adults who had ever used the internet at least some 44% have never undertaken a computer training course[45], around one third (32%) had only undertaken a course over three years ago and just one quarter (25%) had taken a course during the past three years.

For those that had never undertaken any IT training this was most likely due to the belief that they already had sufficient skills, though in a small number of cases, barriers such as cost and the availability of courses were also cited as being a reason.

In general, these IT user skills (i.e. for those living in Great Britain) are most likely to have been self-taught and/or learnt from friends/ colleagues.

[45] Of 3 hours or more

10.0 Current and future skills priorities

This section summarises the current and future skills issues and priorities for the IT & Telecoms professional workforce and IT users in Northern Ireland identified within the earlier sections of this report. Where Northern Ireland specific data is available it is identified and reported otherwise UK data is used.

10.1 IT & Telecoms professionals

10.1.1 Current skills priorities

Advertised demand

On average, there were 500 advertised vacancies for IT & Telecoms professionals in Northern Ireland during each quarter of 2011– the equivalent of around one in 42 actual positions (i.e. there were estimated to be 21,000 IT & Telecoms professionals employed throughout the year).

The majority of adverts for IT & Telecoms positions placed during 2011 in Northern Ireland were in the areas of Development, Design or Support (65%, 11% and 12% respectively) and these groups have accounted for an increasing proportion of advertised vacancies over each of the past three years (growing from 77% in 2008 to 88% in 2011).

The technical skills most often sought by employers were: SQL, .NET, Java, C#, C++, CAD, SQL Server, Unix, ASP and HTML..

Occupational profile

In Northern Ireland in 2011 nearly three quarters (71%) of IT & Telecoms professionals worked in either managerial, strategic or software roles with the large proportion of these (69%) employed as Software Professionals.

Additional analysis of Northern Ireland's employment trends for IT & Telecoms professionals over the last ten years shows a significant increase in the number of these higher level roles, increasing by 67% in this period. By contrast, those in IT & Telecoms Technician/Assistant/Engineering roles have decreased by a quarter (25%).

Recruitment and skills shortages

Amongst UK employers seeking to recruit IT & Telecoms staff during 2011, just under one in seven (14%) reported having difficulties filling the positions advertised. Of these, a similar proportion (15%) stated that they were experiencing IT & Telecoms related skills shortages. The issue of IT & Telecoms related recruitment difficulties was still more acute within the UK IT & Telecoms sector however where just under one half of firms with IT & Telecoms positions reported having difficulty finding applicants to fill them.

IT & Telecoms related skills shortages were most frequently associated with 'Professional' level openings (i.e. as opposed to Managerial, Technician, Assistant or Engineer grade posts) with around four in five (79%) of businesses experiencing IT & Telecoms related skills shortages stating that they were occurring in this area.

In particular, skills shortages were cited by recruiters seeking to fill positions for Programmers/Software Developers and Web Design/Development Professionals.

The job-related technical skills most commonly cited by employers as being hard to find amongst applicants for IT & Telecoms positions were: .NET, ASP.NET, Dynamics, SharePoint, Visual Basic/Visual Studio, C# with PHP and VMWare.

Skills matching in the workplace

Results from the Northern Ireland ICT Snapshot survey (January 2012) identify that 26% of all companies with IT staff are aware of gaps in the

skills of these employees. These firms also report areas for skill improvement as being: Technical skills (78% of firms with skills gaps); Sector knowledge/experience (63%); Business skills (55%); Interpersonal skills (37%) and Leadership skills (29%).

Interestingly firms in Northern Ireland also report skills gaps tend to cause an increase in workload for other staff and lead to outsourcing.

Similarly the results across the UK show that where they are apparent, skills gaps amongst IT & Telecoms professionals are likely to be both of a technical and non-technical nature and will often arise with respect to: sales/related, interpersonal and business/related skills (i.e. non-technical) along with Microsoft (particularly ASP.NET, C and .NET), PHP and Linux (technical).

Again for the UK as a whole, these gaps tend to have a detrimental effect upon the business, as IT & Telecoms staff with gaps are typically thought to be performing only around half as well as they potentially could be.

10.1.2 Future skills

Employment forecasts to 2020

Whilst employment in the overall Northern Ireland workforce is forecast to increase at 0.72% per annum to 2020, the IT professional workforce within the IT industry is forecast to grow at 2.16% per annum, three times as fast as the average employment growth in Northern Ireland

Historic growth trends within the Northern Ireland IT & Telecoms employment are set to continue, with the strongest growth predicted to arise in high skill areas/occupations, particularly Software Professionals, ICT Managers and IT Strategy & Planning staff.

The number of people working as in these roles in Northern Ireland is forecast to continue growing and this group of workers will account for nearly three quarters (73%) of all IT & Telecoms professionals in Northern Ireland by 2020. By contrast, there will be only a modest increase in the number of people working as IT /Telecoms Technicians and Engineers over the same period.

Emerging trends and associated skills needs

Specific technologies with important skills implications are: Cloud Computing; Green IT; Social and Mobile Computing; 'Big data'/Analytics, Smart Computing and Security and Data Protection.

Security and data protection is an issue across many new technologies and IT & Telecoms professionals need the skills to develop integrated security solutions which will fix the vulnerabilities of underlying architecture and infrastructures.

Cloud computing will require project and integrated solutions management skills as well as architecture, infrastructure, networking, security and quality assurance testing skills.

For businesses to take advantage of the use of information and analytics for competitive advantage they need staff with advanced skills in data modelling, simulation and analytics.

With mobile technologies the skills challenges will be around developing new security models for managing and securing devices and services and managing risk.

10.2 Use of IT by the wider population[46]

10.2.1 Current skills priorities

Latest UK estimates from ONS suggest that around 87% of people aged 16 or over have used a computer at some time in their lives and that many have used them to undertake a wide range of activities including computer programming. IT users are likely to have developed their e-mail related skills to a higher level than other IT skills such as word-processing/spread sheets which are most often held at just NVQ entry level 3 or below (compared with NVQ level 2 for emailing/related skills).

Results from the 2011 employer survey carried out by the National Academy for IT for, show around one in six (16%) employers in Northern Ireland were aware of gaps in the skills of their employees whilst, within the UK at least, around 42% of firms with skills gaps were also thought to have gaps in the skills of their IT users.

10.2.2 Future skills priorities

Making the most of technology is arguably the single most important action that can be taken to improve productivity within the Northern Ireland economy. To achieve this all individuals need increasingly sophisticated IT user skills which can be used not only to secure/retain employment but also to enable and enrich their daily lives.

In the workplace, the key to this generic IT up-skilling will lie not only with the 71,000 Northern Ireland managers and leaders who will need to grasp the strategic implications of technology and have the skills to realise its potential but also with the 617,000 workers requiring skills in the use of IT.

However, outside of the workplace not all are engaged with new technology and it is estimated that approximately 8.2 million UK adults are still off-line and hence excluded from the benefits that IT can bring about. More specifically, the groups most likely to be 'digitally excluded' are the families with single parents, those aged 65 or over and the unemployed.

Digital exclusion is seen as going hand in hand with social exclusion - the former serving to exacerbate the latter and hence bringing the digitally excluded online and enabling them to attain pre-requisite skills for life in a technology driven world is a key priority. Only then can this community avoid being left out of the wide and growing range of personal benefits accessing the web brings e.g. improved educational attainment, improved skill levels, improved job level and income, savings from online shopping, and better access to public services and health services.

[46] Due to data availability issues the majority of information generally within this section relates to the UK

11.0 Global ambition and e-skills UK's strategic objectives

This section sets out a vision for Northern Ireland's role in the digital economy and recommended actions to support that vision.

11.1 Vision

The UK has one of the most competitive technology industries in the world, a highly respected technology skills pool, and a particular expertise in the application of technology to deliver business benefit. Our vision is that the UK is recognised as a global leader in delivering business value from technology.

11.2 Rationale for change

Strategic action to accelerate the development of the skills pool in line with this vision is essential for the future. Information Technology and Communications systems are at the heart of every organisation, they underpin the delivery of high quality, cost effective public services, and they are central to the fabric of our daily lives.

11.3 The challenges

IT & Telecoms is at the heart of the modern economy, supporting the value add of practically all organisations in every sector. It is fundamentally affecting companies in all sectors and making the most of technology is arguably the single most important step that can be taken to improve productivity across the economy.

- For businesses across all sectors there are significant opportunities to be had by investing in and optimising ICT. To exploit the transformational potential of technology requires a new level of business innovation,
- All individuals increasingly need sophisticated skills in the use of IT for social and economic purposes,
- Managers and leaders need to grasp the strategic implications of technology and have the skills to realise its potential,
- Workforce growth combined with restructuring and skills shifts mean attracting high quality recruits into the IT & Telecoms workforce is critical to competitiveness and developing those in the workforce, as well as new entrants is vital to sustain continued growth. Security and data protection remain crucially important,
- The choices of young people are not supporting the growth of the sector: gender imbalance is prevalent across IT related courses; there are concerns about the curriculum in schools; and students and their advisors often have an extremely poor understanding of IT related careers with young people commonly holding negative perceptions as a result.

A coherent, strategic approach to skills is fundamental to enabling the economy to derive maximum benefit from the power of technology; transforming competitiveness and productivity through the creation of appropriate technology related skills. With this, Northern Ireland can be a global leader in technology. Without it, the country will become a second rate player in a high technology world.

Making the most of technology is arguably the single most important step that can be taken to improve productivity across the economy

In Northern Ireland the need for broader, deeper and continually changing skills affects not only the 28,000 people in the IT workforce, but also the 71,000 business managers and leaders who need to understand how to realise the potential of ICT, together with the 617,000 workers requiring skills in the use of IT.

11.4 Recommended strategies

Employers remain committed to addressing skills pipeline issues, such as the curriculum in schools and universities, and the gender divide. There is also increasing interest in collaborative action to make it easier to recruit and train new entrants to the sector and to improve the mobility and

development of the existing workforce. Alongside this, the continuing challenges of the economic environment places particular emphasis on products and services that reduce cost or increase return on investment.

Based on the analysis and skills priorities set out in this document, and taking account of the current environment, e-skills UK will work together with partner organisations to deliver on three key strategic objectives to ensure Northern Ireland is truly world class at delivering maximum value from technology both in business and in society more widely:

1. Inspire future talent

To motivate talented students to pursue IT & Telecoms related careers and better prepare all young people for work in a technology-enabled world.

We will galvanise employer investment in young people so that:

- An increasing proportion secure employment in the growing IT & Telecoms workforce, via industry-valued full time degrees, part-time degrees and apprenticeships,
- New mainstream qualifications are established, which appeal to students and are valued for their rigour and relevance by the most demanding universities and employers,
- A generation of young people – especially women - are inspired to pursue IT-related education and technology-rich careers.

2. Support IT & Telecoms professionals

Develop the IT & Telecoms professional skills pool as the best in the world for deriving business benefit from technology.

We will galvanise the investment of employers and individuals in IT & Telecoms professional skills so that:

- The sector is maximising its potential for employment and economic growth by attracting and developing talent,
- New recruits are undertaking the training they need to become more productive more quickly, including through increased uptake of Apprenticeships and part-time degrees and increased use of IT Professional Standards,
- More IT & Telecoms professionals are up-skilling in order to maximise their business contribution and career potential.

3. Increase digital capability

Trigger increased investment in the IT capability of all individuals and businesses in every sector.

We will galvanise the collaborative action of employers and government so that:

- Individuals seeking employment can understand and access training to achieve a clear minimum standard of digital literacy,
- Employers in every sector have a better understanding of how to deliver business value from IT.

To enable all of the above, we will:

- Maintain the quality and vitality of our employer leadership and wider employer engagement,
- Underpin all of our work with world-class labour market intelligence,
- Ensure there is a coherent qualifications strategy for the sector which is driven by the needs of employers and learners,
- Bring together effective partnerships to improve the impact and value for money of action on skills.

Annex A: IT & Telecoms professional occupations

e-skills UK has been licensed to address skills issues relating to all IT & Telecoms professionals working in the UK irrespective of the industry sector in which they are employed. More specifically, this means workers identified by the following Standard Occupational Classification (SOC) codes:

SOC (2000)	Summary	Related Job Titles
1136 INFORMATION AND COMMUNICATION TECHNOLOGY MANAGERS	Plan, organise, direct and co-ordinate the work necessary to operate and provide information communication technology services, to maintain and develop associated network facilities and to provide software and hardware support.	• Computer Manager • Computer Operations Manager • Data Processing Manager • IT Manager • Systems Manager • Telecom Manager
2131 IT STRATEGY AND PLANNING PROFESSIONALS	Provide advice on the effective utilisation of information technology in order to solve business problems or to enhance the effectiveness of business functions.	• Computer Consultant • Software Consultant
2132 SOFTWARE PROFESSIONALS	Responsible for all aspects of the design, application, development and operation of software systems.	• Analyst Programmer • Computer Programmer • Software Engineer • Systems Analyst • Systems Designer • Games Developer • Web Designer/ Developer
3131 IT OPERATIONS TECHNICIANS	Responsible for the day-to-day running of computer systems and networks including the preparation of backup systems, and the performance of regular checks to ensure the smooth functioning of such systems.	• Database Manager • IT Technician • Network Technician • Systems Administrator • Web Master
3132 IT USER SUPPORT TECHNICIANS	Responsible for providing technical support, advice and guidance for customers or IT users within an organisation, either directly or by telephone, email or other network interaction.	• Help desk Operator • Helpline Operator (computing) • IT Helpline Support Officer • Support Technician (computing) • Systems Support Officer
4136 DATABASE ASSISTANTS AND CLERKS	Create, maintain, preserve and update information held in electronic databases, computer files, voice-mailboxes and email systems.	• Computer Clerk • Data entry Clerk • Data Processor • VDU Operator

Cont...

5242 TELECOMMUNICATIONS ENGINEERS	Install, maintain and repair public and private telephone systems.	• Technical Officer (telecommunications) • Telecommunications Engineer • Telephone Engineer • Telephone Installation Engineer • Telephone Technician
5243 LINE REPAIRERS AND CABLE JOINTERS	Install, maintain, test and repair overhead, underground, surface and submarine electricity and telecommunications cables.	• Cable Jointer • Telegraph Linesman • Telephone Linesman • Telephone Wireman
5245 COMPUTER ENGINEERS, INSTALLATION AND MAINTENANCE	Install, maintain and repair personal computers, mainframe and other computer hardware.	• Computer Engineer • Computer Maintenance Engineer • Computer Service Engineer • Computer Service Technician

For simplicity, and to avoid issues of data suppression, in certain sections of the report, occupational codes have been summarised in the following manner to aid the reader.

SOC level	SOC Major Group	IT & Telecoms grouping	IT & Telecoms occupations	IT & Telecoms SOC codes
1	Managers and Senior Officials	IT & Telecoms Management	• ICT Managers	• 1136
2	Professional occupations	ICT Professionals	• IT Strategy & Planning Professionals • Software Professionals	• 2131 • 2132
3	Associate Professional and Technical	IT & Telecoms Technicians	• IT Operations Technicians • IT User Support Technicians	• 3131 • 3132
4	Administrative and Secretarial	IT & Telecoms Assistants	• Database Assistants & Clerks	• 4136
5	Skilled Trades Occupations	IT & Telecoms Engineers	• Telecommunication Engineers • Line Repairers & Cable Jointers • Computer Engineers	• 5242 • 5243 • 5245
6	Personal Service Occupations			
7	Sales/Customer Service Occupations			
8	Process, Plant and Machine Operatives			
9	Elementary Occupations			

Annex B: IT & Telecoms industrial classifications

In the same way that specific SOC codes are employed to identify the core occupational focus of our activities (or 'footprint') Standard Industrial Classification (SIC) codes are used to define the industrial sectors for which e–skills UK are licensed by Government. These codes are as follows:

SIC 2003	
22.33	Reproduction of computer media
64.2	Telecommunications
72	Computer & related activities
72.1	Hardware consultancy
72.2	Software consultancy & supply
72.21	Publishing of software
72.22	Other software consultancy & supply
72.3	Data processing
72.4	Database activities
72.5	Maintenance & repair of office, accounting & computing machinery
72.6	Other computer related activities

SIC 2007	
18.20/3	Reproduction of computer media
58.2	Software publishing
58.21	Publishing of computer games
58.29	Other software publishing
61	Telecommunications
61.1	Wired telecommunications activities
61.2	Wireless telecommunications activities
61.3	Satellite telecommunications activities
61.9	Other telecommunications activities
62	Computer programming, consultancy & related activities
62.01	Computer programming activities
62.01/1	Ready-made interactive leisure & entertainment software development
62.01/2	Business & domestic software development
62.02	Computer consultancy activities
62.03	Computer facilities management activities
62.09	Other information technology activities
63.1	Data processing, hosting & related activities; web portal
63.11	Data processing, hosting & related activities
63.12	Web portals
95.1	Repair of computers & communications equipment
95.11	Repair of computer & peripheral equipment
95.12	Repair of communication equipment

Other relevant SIC codes

e-skills UK has an interest in the elements of management and consultancy concerned with technology and business change:

70.22/9	Management consultancy activities (other than financial management)

e-skills UK also has a shared interest in technology manufacturing, a sector for which SEMTA has been designated as the lead SSC with responsibility for skills and related issues:

26.2 Manufacture of computers and peripheral equipment		
	26.20 Manufacture of computers and peripheral equipment	
26.3 Manufacture of communication equipment		
	26.30 Manufacture of communication equipment	
		26.30/1 Manufacture of telegraph and telephone apparatus and equipment
		26.30/9 Manufacture of communication equipment (other than telegraph and telephone apparatus and equipment)
	27.31 Manufacture of fibre optic cables	

Other codes of relevance include wholesale and retail sale of ICT equipment for which Skills for Logistics and Skillsmart have been designated as the lead SSCs with responsibility for skills and related issues:

46.5 Wholesale of information and communication equipment	
	46.51 Wholesale of computers, computer peripheral equipment and software
	46.52 Wholesale of electronic and telecommunications equipment and parts

47.4 Retail sale of information and communication equipment in specialised stores		
	47.41 Retail sale of computers, peripheral units and software in specialised stores	
	47.42 Retail sale of telecommunications equipment in specialised stores	
		47.42/1 Retail sale of mobile telephones in specialised stores
		47.42/9 Retail sale of telecommunications equipment (other than mobile telephones) not elsewhere classified in specialised stores

To avoid issues of data suppression and for comparison purposes, industry codes have sometimes been combined to form the following broad groups:

IT Services (SIC codes: 58.21, 58.29, 62.01, 62.01/1, 62.01/2, 62.02, 62.03, 62.09, 63.11, 63.12 and 95.11)

IT Manufacturing (SIC codes: 18.20/3 and 26.20)

IT Wholesale/Retail (SIC codes: 46.51 and 47.41)

Telecoms Services (SIC codes: 61.10, 61.20, 61.30, 61.90 and 95.12)

Telecoms Manufacturing (SIC codes: 26.30/1, 26.30/9 and 27.31)

Telecoms Wholesale/Retail (SIC codes: 46.52, 47.42/1 and 47.42/9)

Annex C: Glossary

ASHE	Annual Survey of Hours and Earnings
BIS	UK Department for Business Innovation and Skills
CPHC	Council of Professors and Heads of Computing
DfE	Department for Education
DLHE	Destination of Leavers from Higher Education
FE	Further Education
GCSE	General Certificate of Secondary Education
GDP	Gross Domestic Product
GVA	Gross Value Added
HE	Higher Education
HEI	Higher Education Institution
HESA	Higher Education Statistics Agency
HND	Higher National Diploma
ICT	Information and Communications Technology
IDBR	Inter Departmental Business Register
JACS	Joint Academic Coding System
JCQ	Joint Council for Qualifications
LEP	Local Enterprise Partnership
LFS	Labour Force Survey
ONS	Office for National Statistics
PROCOM	The IT Professional Competency Model
SIC	Standard Industrial Classification
SME	Small or Medium Sized Enterprise
S/NVQ	Scottish/National Vocational Qualification
SOC	Standard Occupational Classification
SSC	Sector Skills Council
SQA	Scottish Qualifications Authority
UCAS	Universities and Colleges Admissions Service

Annex D: Supporting data

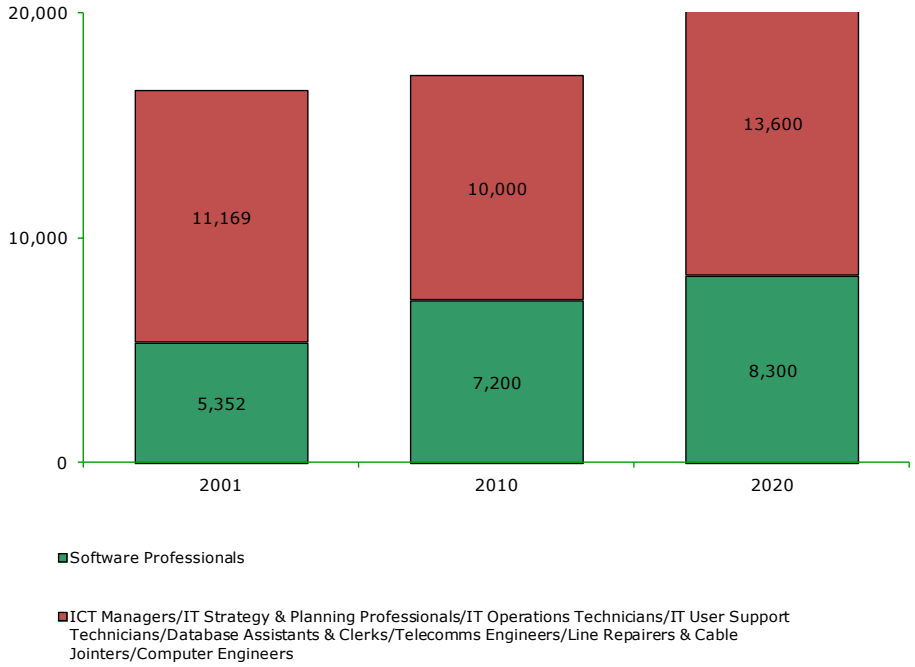
Demand and supply of IT & Telecoms labour and skills (section 6)

Table 6: Forecast annual average employment growth rates per annum in Northern Ireland 2011-2020

	Growth per annum (%)
IT professionals	2.01%
IT professionals within the IT industry	2.16%
IT professionals in all other sectors	1.91%
The IT industry	0.07%
All other occupations within the IT industry	-1.84%
Telecoms professionals	1.10%
The Telecoms industry	0.96%
Northern Ireland workforce: all sectors	0.72%

Source: e-skills UK analysis of Experian employment forecasts 2011

Figure 16: Number of IT & Telecoms professionals by occupation in Northern Ireland 2001, 2010 and forecast to 2020



Source: e-skills UK analysis of data from the ONS Labour Force Survey 2010 four quarterly average together with 2011 forecasts from Experian.

Table 7: Forecast growth rates per annum, and relative size, of IT & Telecoms professionals by sector 2011 to 2020.

Sector	Growth per annum 2011 to 2020	% of IT & T professional workforce in 2011
Financial Intermediation (auxiliary activities)	5.60%	2.03%
Transport Activities of Travel Agents (supporting & auxiliary)	5.27%	1.31%
Research & Development	4.52%	0.83%
Financial Intermediation, (excl Insurance & Pension Funding)	3.94%	4.80%
Retail Trade, Except of Motor Vehicles & Motorcycles, Repair of Personal & Household Goods	3.27%	3.10%
Manufacture of Motor Vehicles, Trailers & Semi-Trailers	2.97%	0.36%
Manufacture of Machinery & Equipment Not Elsewhere Specified	2.89%	0.76%
Other Business Activities	2.76%	8.88%
Manufacture of Electrical Machinery & Apparatus Not Elsewhere Specified	2.71%	0.38%
Hotels & Restaurants	2.59%	0.51%
Wholesale Trade & Commission Trade, Except Motor Vehicles & Motorcycles	2.55%	2.64%
Manufacture of Medical, Precision & Optical Instruments, Watches & Clocks	2.52%	0.81%
Real Estate Activities	2.45%	0.48%
Post & Telecommunications	2.41%	8.20%
Computer/related activities	2.34%	26.65%
Health & Social Work	2.15%	3.82%
Recreational, Cultural & Sporting Activities	2.04%	1.57%
Construction	2.00%	6.34%
Manufacture of Fabricated Metal Products, Except Machinery & Equipment	1.99%	0.43%
Education	1.91%	5.26%

Source: e-skills UK analysis of Experian employment forecasts 2011

Table 8: IT & Telecoms professionals – recruitment sources for new entrants in Northern Ireland

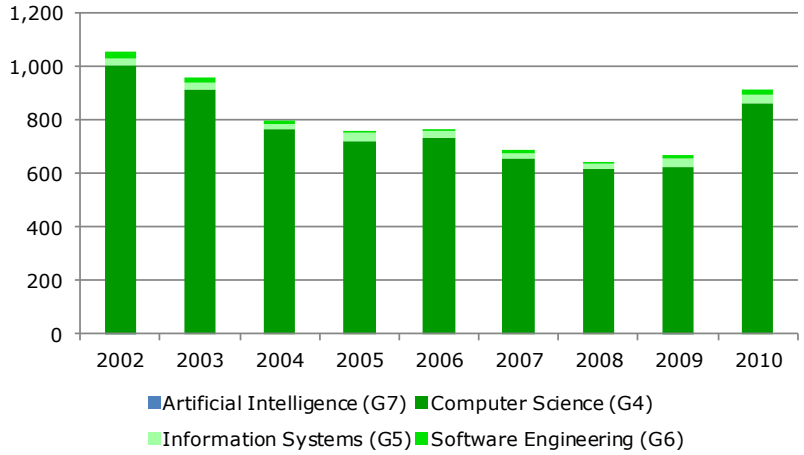
Recruitment source	Number (average pa to 2015)	Share
Those already in work (in occupations other than IT or Telecoms)	1,000	43%
Individuals joining from education	400	17%
Other sources	900	39%
Total	**2,300**	**100%**

Source: Experian/e-skills UK employment forecasts, 2011

IT related education and qualifications (section 8)

Higher Education

Figure 17: Number of applicants onto IT related HE courses in Northern Ireland, 2002-2010, UK domicile

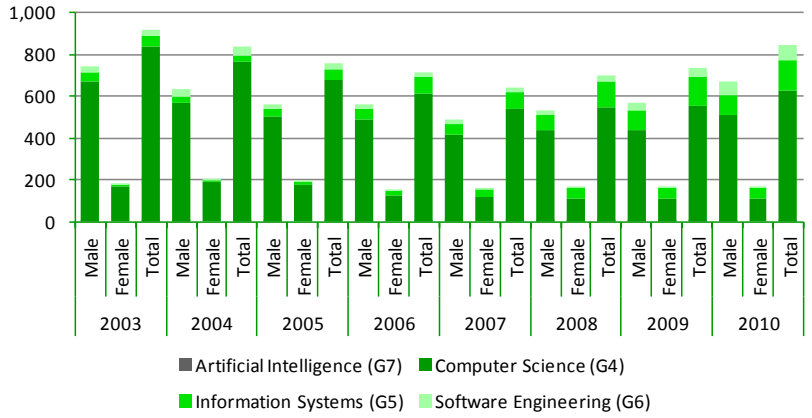


Source: e-skills UK analysis of data from UCAS

Figure 18: IT professional workforce/applicants to Computing discipline Higher Education courses in Northern Ireland, 2002-2010

Source: e-skills UK analysis of data from the ONS Labour Force Survey and UCAS (data analysis based on subject lines G4-7 of UK applicants)

Figure 19: Acceptances onto Computing discipline Higher Education courses in Northern Ireland by gender, UK domicile



Source: e-skills UK analysis of UCAS data

Table 9: Qualifiers in Northern Ireland in Computing and Telecoms Higher Education courses, 2006/07-2009/10, UK domicile

		The Queen's University of Belfast	University of Ulster	Total
2006/07	Number	195	410	605
	% of total in NI	32%	68%	100%
2007/08	Number	185	395	580
	% of total in NI	32%	68%	100%
2008/09	Number	175	350	525
	% of total in NI	33%	67%	100%
2009/10	Number	135	400	535
	% of total in NI	25%	75%	100%

Source: e-skills UK analysis of Higher Education Statistics Agency qualifiers data 2007-2010

Note: Figures may not add up due to rounding

Table 10: Level of degree qualification, 2009/10, UK domicile

	Northern Ireland		UK	
	Computing	Telecoms	Computing	Telecoms
Postgraduate	11%	37%	16%	25%
First degree	75%	58%	60%	58%
Undergraduate - other (eg Foundation degree)	14%	5%	24%	17%
Total	100%	100%	100%	100%

Source: e-skills UK analysis of Higher Education Statistics Agency qualifiers data, 2010

Table 11: Destination of graduate respondents entering IT & Telecoms occupations by region of employment and institution, 2009/10, all domicile

		Region of Institution											
		North East	North West	Yorkshire & Humber	East Midlands	West Midlands	East of England	London	South East	South West	Northern Ireland	Scotland	Northern Ireland
Region of Employment	England	94%	91%	95%	95%	94%	91%	89%	91%	89%	6%	21%	36%
	North East	54%		1%		1%			1%				
	North West	5%	61%		3%	3%	2%	1%	2%	1%		1%	4%
	Yorkshire& Humber	9%		48%	3%	1%			3%	1%	1%	1%	1%
	East Midlands	3%	3%	8%	39%	4%	2%	1%	2%	1%		1%	1%
	West Midlands	1%	2%	4%	8%	43%	1%	1%	3%	3%		2%	6%
	East of England	2%	3%	3%	8%	5%	46%	4%	7%	3%		2%	2%
	London	11%	8%	12%	17%	15%	27%	66%	23%	15%	2%	8%	7%
	South East	4%	6%	7%	12%	9%	11%	12%	41%	17%	1%	3%	8%
	South West	3%	2%	2%	4%	4%	1%	1%	6%	49%		1%	7%
	Northern Ireland	1%	1%						1%		85%	1%	
	Scotland	1%		1%	1%	1%			2%	4%		70%	
	Northern Ireland		2%	1%	1%	1%			1%	1%			58%
	Overseas	4%	5%	4%	2%	4%	9%	10%	4%	5%	9%	8%	5%

Key

	Largest proportion
	2nd largest proportion
	3rd largest proportion

Source: e-skills UK analysis of HESA 'Destinations of Leavers from Higher Education' data, 2009/10

Note: Figures may not add up due to rounding

Table 12: Graduate entry to IT & Telecoms occupational areas from all courses, 2009/10

Description	Northern Ireland	UK
Information and Communication Technology Managers	5.3%	10.9%
IT Strategy and Planning Professionals	5.8%	8.7%
Software Professionals	60.5%	49.5%
Technician roles	11.9%	16.4%
Other IT & Telecoms roles	16.5%	14.6%
Total	**100.0%**	**100.0%**

Source: e-skills UK analysis of HESA 'Destinations of Leavers from Higher Education' data, 2009/10

Further Education

Table 13: Enrolments on IT & Telecoms related subject area by level of study, 2009/10

Subject Area	Level 1 and entry	Level 2	Level 3	HE	Total
Information Technology	2,200	2,260	2,045	360	6,870
Computer Education	305	465	335	25	1,135
Computer Studies	660	275	130	195	1,260
Software	100	110	110	60	380
Office Studies/Technology	-	-	50	-	50
Business Computing	-	-	65	-	65
Others in Computing	625	280	125	135	1,170
Software Engineering	70	60	310	50	490
Computer Aided Engineering	-	15	-	-	15
Applied Information Technology	95	35	50	25	205
Applied Computing	-	-	140	-	140
Electronics & Computer Technology	-	-	115	30	145
Programming	-	10	30	45	85
Computing Science	-	20	-	45	60
Communications Engineering	-	-	20	-	20
Systems Analysis & Design	-	20	-	-	20
Information Systems	-	40	5	-	45
Mathematics, Statistics & Computing	-	-	20	-	20
Computer Systems Engineering	-	15	-	-	15
Data Processing	-	-	5	-	5
Total IT & Telecoms	**4,060**	**3,600**	**3,565**	**970**	**12,195**

Source: e-skills UK analysis of data from Department for Learning and Development Northern Ireland (DELNI)

Notes:
- Figures may not add up due to rounding
- From the data classification it is likely there is a mix of IT & Telecoms professional and IT user in these categories but IT user tends to be delivered at levels 1 and 2

Schools and Colleges

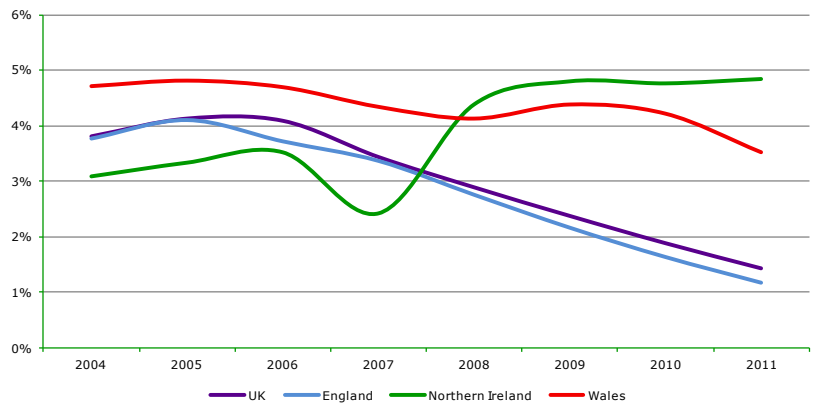
Table 14: Uptake of ICT GCSEs in Northern Ireland, 2004-2011

Year	Full course ICT GCSE	Short course ICT GCSE	Applied ICT GCSE	Total
2004	5,135	920	495	6,555
2005	5,620	915	410	6,945
2006	5,865	985	290	7,140
2007	4,005	695	255	4,955
2008	7,195	1,295	275	8,765
2009	7,455	1,550	240	9,245
2010	7,705	1,290	160	9,155
2011	8,040	1,115	190	9,345

Source: e-skills UK analysis of data from the Joint Council for Qualifications

Note: Figures may not add up due to rounding

Figure 20: All IT related GCSEs as a percentage of total GCSEs sat, 2004-2011



Source: e-skills UK analysis of data from the Joint Council for Qualifications, 2004-2011

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