

FINAL DRAFT

Digital Skills in the Heart of the South West

June 2014

Ben Neild & Chris Evans
SLIM, Marchmont Observatory, University of Exeter

Table of Contents

Table of Contents	2
Table of Figures	3
Table of Tables	3
BACKGROUND	4
INTRODUCTION	ERROR! BOOKMARK NOT DEFINED.
THE UK'S DIGITAL COMPETITIVENESS	6
DIGITAL ECONOMY - BUSINESS BENEFITS	8
DIGITAL TRENDS	10
Cloud computing	10
Remote & Flexible Working	10
Borderless Collaboration	11
Big Data, Information and Analytics	11
Real World Web	11
E-learning	12
SKILLS NEEDS	13
IT and Telecoms professionals	13
Employment trends - National	13
Employment trends - Local	14
Skills shortages	15
Skills gaps	15
Future Skills Needs	15
Business Leaders and Managers	16
IT Users	17
Workforce	17
Digital Inclusion	18
THE SUPPLY OF QUALIFICATIONS	20
GCSEs	20
A levels	20
SFA funded learning	22
Apprenticeships	23
Higher education	23
Graduate Destinations	Error! Bookmark not defined.
POLICY DISCUSSION	ERROR! BOOKMARK NOT DEFINED.
POLICY DISCUSSION	27
Innovation	27
Business Support	28

The Digital Skills Pipeline	29
Apprenticeships.....	30
Graduate Retention	31
ICT Professionals	31
ICT Users	32
Workforce	32
Digital Inclusion	32

Table of Figures

Figure 2: Digital skills of disadvantaged people, 2012 (% individuals)	18
Figure 3: GCE A level entries in ICT and Computer Studies, 2002 - 2011, England	20

Table of Tables

Table 1: GCSE entries in IT, 2007/8 to 2012/13, England	20
Table 2: GCE A-level entries by 16-18 year olds, 2010/11 v 2011/12	21
Table 3: Volume of SFA Learning Aims in Business Information Technology & Telecommunication taken up learners residing in HotSW, 2010/11 and 2011/12.....	22
Table 4: Volume of Learning Aims by learning type, Business Information Technology & Telecommunication, HotSW residents, 2010/11 and 2011/12	23
Table 5: Apprenticeship Starts in ICT, HotSW v England, 2005/6 to 2013/14.....	23
Table 6: Applications and Acceptances for Mathematical and Computer Science within the proposed GIF bid area, 2011/12.....	24
Table 7: HE Qualifications achieved at HotSW HEIs, 2003/4 to 2011/12.....	26
Table 8: Computer Science qualifications achieved at the Universities of Exeter and Plymouth, 2003/4 to 2011/12.....	26

INTRODUCTION

The Heart of the South West (HotSW) LEP's Strategic Economic Plan (SEP) identifies attracting digital and technology companies to a 'Silicon' South West as a central priority.

Although much of HotSW benefits from good connectivity, there remains a need to bring Superfast Broadband and mobile infrastructure to many rural communities and businesses. The LEP is addressing this through its Local Growth Deal, which seeks investment to extend the coverage of Superfast Broadband to 95% of the area by 2017 and 100% of the area by 2020 and to install 40 new masts, improving mobile coverage from 91% to 97%.

The case for this investment is clear from a number of studies showing high levels of economic and social return from public investment in digital infrastructure. The UK Broadband Impact Study¹, for example, models a £20 return for every £1 of public investment, arising primarily as a result of productivity growth among broadband-using enterprises, but also from increased labour market participation, safeguarded employment and increases in teleworker productivity.

Local businesses are highly supportive of investment in this area, identifying digital and mobile infrastructure both as a constraint and a potential enabler of growth.

While physical access to Superfast Broadband and Mobile infrastructure is a fundamental starting point, it is skills and the creativity of individuals and businesses using this technology that yields the economic and social returns. This is recognised in HotSW LEP's EU Structural and Investment Fund strategy, which sets aside £12.25m of EU funding² for the delivery of an integrated package including:

1. Improvements in digital infrastructure;
2. Support for small businesses to take-up digital technologies and implement transformational change in their operations;
3. Skills support for:
 - digital inclusion,
 - the ICT sector; and
 - the effective application of ICT across all industry sectors, driving innovation and improvements in productivity.

The report focuses on the second and third of these objectives, on business support and skills. It is written to inform discussion about the support required to deliver HotSW's Digital aspirations and how this might best be targeted and delivered.

¹ UK Broadband Impact Study, SQW, November 2013

² This is made up of £4.75 European Regional Development Funding, £3m of European Social Funding and £4.5m of European Agricultural Funding for Rural development

Since 2011, HotSW LEP has been focused on supporting local businesses to grow out of recession creating wealth and jobs across Somerset, Devon, Torbay and Plymouth. The focus on digital skills and bringing the area's ICT infrastructure up to the best international standards is part of a drive both to address economic and social exclusion in rural communities and to create the right conditions for knowledge-intensive, export-oriented growth across the area. The strategy coheres with wider thinking, such as that of the World Economic Forum which emphasises both the role IT plays in driving innovation, productivity and efficiency gains across all industries alongside its role in improving people's daily lives.

There is a wealth of evidence on the link between the uptake of ICTs and productivity improvement. WEF estimate that globally a 10% rise in mobile phone penetration is associated with 1% growth in GDP³. Academics at LSE have estimated that half of Europe's recent productivity gains can be attributed to IT investments⁴. At the national level, the UK Broadband Impact study estimates that the availability and take-up of faster broadband speeds will add £17 billion to the UK's annual Gross Value Added (GVA) by 2024, equivalent to an annual GVA uplift of 0.07 percentage points over this period.

These are, of course, all estimates. No one knows exactly how people will use superfast broadband, what business innovations it will give rise to or the scale of the productivity improvements that will result. We have a number of ideas, which we explore later in this report. However, we do know that high quality connectivity will open an array of new possibilities for businesses and that those businesses that make good use of ICTs will have a considerable advantage over those that do not.

³ World Economic Forum, *'The Global IT Report'*, 2011

⁴ London School of Economics, *'It ain't what you do it's the way the you do I.T'*, Bloom, Sadun and Van Reenen, July 2005

THE UK'S DIGITAL COMPETITIVENESS

The European Commission has identified the Digital Agenda as one of the seven pillars of its Europe 2020 strategy, arguing that ICT has evolved into a 'general purpose technology' of our time with spill-overs to all economic sectors, the capacity to transform business practices and economic activities⁵.

To support its strategy, the EU monitors the Digital Performance of its 28 member states. The latest data⁶ shows that:

- **Connectivity** - The UK has good connectivity, with 82% of households benefitting from next generation broadband coverage, compared to 62% across all EU countries.
- **Internet Usage** - The UK has high levels of internet usage, with:
 - 87% of the population as regular internet users, compared to 72% across the EU, and
 - Just 8% of individuals who had never used the internet, compared to 20% across the EU.
- **Digital Skills** - The UK has only slightly better than average digital skills, with:
 - 35% of the workforce with low or no digital skills, compared to 39% across the EU, and 62% of 'Disadvantaged People'⁷ with low or no digital skills, a figure only just above the EU average of 64%.
- **eCommerce** – The UK has high levels of eCommerce, with:
 - 77% of people buying goods or services online, compared to 47% across the EU;
 - 42% of large enterprises selling online, compared to 32% across the EU; and
 - 18% of UK SMEs selling online, compared to 14% across the EU.
- **E-business** – take-up of a number of forms of e-business remains low in the UK, with:
 - just 24% of enterprises sending or receiving electronic invoices, compared to 29% across the EU; and

⁵ Europe 2020 Competitiveness Report, 2012, World Economic Forum

⁶ See <http://digital-agenda-data.eu>

⁷ Disadvantaged people are defined as those aged 55-74, low educated, unemployed, retired or inactive.

- 10% of SMEs using enterprise resource planning software to share information between different functional areas (e.g. accounting, planning, production, marketing), compared to 25% across the EU.

This last finding is consistent with data from 2010, which ranked the UK 26th out of 27 EU states for the proportion of enterprises sharing information electronically with customers or suppliers; 24th for using applications for integrating internal business processes; and 26th for the proportion of enterprises using analytical Customer Relation Management. It is also consistent with the results from the World Economic Forum Competitiveness Index, which finds that the UK ranks fairly well against measures for: Internet bandwidth (8th globally); Internet Users (8th); Broadband subscriptions (12th) and the availability of the latest technologies (7th). However, we fare less well on measures for: Firm-level technology absorption (22nd); and Foreign direct investment and technology transfer (23rd).

Although above the EU average, it is also arguable that, at 18%, the proportion of UK SMEs selling online remains sub-optimal, and that this figure is growing too slowly. Between 2012 and 2013, the proportion of SMEs selling online grew by just 1 percentage point, with the result that we lag the leading EU nations on this measure, such as Denmark (22.5%), the Czech Republic (21%) and Norway (20.5%).

DIGITAL ECONOMY - BUSINESS BENEFITS

In the broadest terms, access to high quality ICTs and connectivity enhances productivity and growth by: supporting improved communication and collaboration between staff and enterprises; lowering costs; providing access to new markets; broadening consumer choice; and encouraging competition. At enterprise level the benefits are multifarious, depending on the sector, size, location and market of individual companies.

Engagement in the digital economy not only changes the way existing enterprises conduct current business practice. It also allows new products, businesses and business clusters to be created. This is a central aspect of the HotSW strategy which focuses on creating the knowledge and ICT infrastructure required to attract enterprises focused on 'big data' aggregation and analytics to the region. The continual generation of data from social media sites, mobile devices, smart meters, satellites and other sources, coupled with advances in data storage and processing, is identified as being not only a source of competitive advantage for existing enterprises, but the basis for the growth of new 'big data' analytics clusters focused on marine, environmental and health-related services.

Most enterprises currently already make some use of ICT, but for fairly limited purposes - marketing, web-based research and email. Others will use advances in ICT, Superfast Broadband and mobile connectivity in a host of more sophisticated ways, for example to:

- Engage in crowdsourcing, to: raise finance from multiple online investors; allocate micro-tasks to large numbers of online collaborators; or harvest data from large numbers of participants in research or commercial projects.
- Transmit data from rural manufacturers to 3D printing specialists, resulting in the rapid creation of prototypes and one-off components;
- Aggregate clinical information to improve health-care efficiency;
- Develop / commercialise the use of augmented reality apps that allow data (e.g. historical notes / opening times) to appear as overlays when mobile devices are pointed at real-world locations; or
- More simply, to enable customers to take a virtual walk through a hotel before booking and paying on-line.

The key point, emphasised in DCMS' evaluation of the Superfast Pilots, is that *'critical to realising the economic benefits (of superfast broadband) is the need to build the capacity and understanding of the benefits of broadband among local businesses'*⁸.

⁸ *Broadband Delivery Programme: Superfast Pilots – Lessons Learnt Report*, DCMS, November 2011, p. 18

This report also suggests that *'there is a huge appetite for superfast broadband, but a mismatch between the level of demand and the knowledge about how it can be exploited. In particular, there is a knowledge gap among business around the potential benefits of superfast broadband and the risk that investment in infrastructure, if not complemented by a programme of support will not lead to the competitiveness gains (that businesses and government are seeking).'*⁹

e-skills uk support this contention, arguing that for the UK to maintain a leadership position in the digital economy, we need both: *'a vibrant, growing highly skilled workforce of 'Digital Professionals' and an 'increasingly large pool of technology-capable business people, who understand the strategic implications of technology and have the ability to realise its potential for business innovation, productivity and competitiveness'*.¹⁰

⁹ Ibid

¹⁰ *Strategic Skills Assessment for the Digital Economy*, e-skills uk, 2009, p. 13.

DIGITAL TRENDS

Although it is difficult to predict exactly how the digital economy will develop, we can point to a number of trends that will impact on businesses in the future¹¹.

Cloud computing

Cloud computing will allow businesses and their employees access applications and technology remotely, as and when they need it, from any location. Programmes will no longer need to be loaded onto individual PCs and businesses will no longer need to devote significant sums of capital to buying and maintaining hardware. Charges will be incurred as applications are used 'in the cloud' resulting in businesses being able to expand or scale back quickly and easily with little financial risk. As it occurs on-line, access to Superfast Broadband is a pre-condition for any business switching to this technology.

Businesses will need the skills and / or external support to assess the business benefits of cloud computing as well as the risks, such as the security risks resulting from their data no longer being kept inside the business. They will also need high level project management skills to ensure that migrating to cloud computing does not interfere with normal operations.

Remote & Flexible Working

Superfast broadband, mobile technologies and cloud computing will allow large numbers of employees to work from multiple locations – home, vehicles, customer premises, different offices / spaces within an office and so on. Many organisations may increasingly ask themselves 'what is an office for, who needs to be there and when?'

The spread of a digital economy will lead to increasing numbers of enterprises considering ways in which office and transport costs can be reduced. Where this occurs, managers will need to focus on overseeing the delivery of outcomes rather than punctuality and hours worked. Distinctions between 'personal' and 'corporate' time will become blurred, as it becomes increasingly normal to check work-related email during evenings and holidays. Distinctions between personal and professional blogs, twitter accounts, and social networking may also blur, with customers following the activities, thoughts and lifestyles of some staff on a 24/7 basis.

This blurring is also likely to apply to equipment, with employees increasingly using personal devices for business use. Business leaders will need to consider the remuneration implications of shifting costs (space, heating, telecoms, IT) into home environments as well as the challenges of maintaining motivation, corporate and team identity among dispersed workforces.

¹¹ The trends described below are identified in and largely taken from *Technology Insights 2011, Trends and UK Skills Implications*, e-skills uk, 2011

Borderless Collaboration

Superfast broadband will enable new levels of business and employee collaboration, through video conferencing, joint working on documents or design-based projects (architectural design or animation for instance) across any distance. Businesses will increasingly require IT systems that enable collaborations to take place between anyone, anytime, on any device, from any place, including overseas. Technology professionals will need to ensure that IT systems allow such collaborations to take place, securely and seamlessly. Business leaders will need to consider the staffing implications once it is possible to source talent from a potentially global pool and via crowdsourcing.

Alongside borderless production, superfast broadband also supports borderless sales and consumption, creating scope for smaller companies, including those in remote locations, to gain access to global markets.

Big Data, Information and Analytics

It is estimated that 90% of the data in the world today has been created in the last two years. Advances in computer memory capacity, processing power and parallel-processing algorithms has made it possible to store and analyse huge amounts of data that results from our use of digital technologies. The growing use of big data will open new commercial opportunities, such as businesses providing data aggregation and analytics services to a diversity of businesses in areas ranging from climate change, health and manufacturing¹².

At the firm level, more and more data generated by IT is increasingly being used in the board-room. This data increasingly focuses on customer profiling and using information about individuals' interactions with the company to manage and personalise customer relationships.

In a study of 179 large publicly traded firms, Prof. Brynjolfsson of MIT found that companies that use 'data-driven decision-making' are about 5% more productive and profitable than their competitors¹³. 'There is' he says in a recent interview for the Guardian 'a lot of low-hanging fruit for companies that are able to use big data to their advantage'¹⁴

This is creating a growing need for the modelling, simulation and analytical skills needed to derive business conclusions from operational data.

Real World Web

The combination of superfast broadband, 4G wireless technologies and smart-phones with built-in GPS, will enable a wide range of new forms of real-time, on-line content to be

¹² Micklethore, *Exeter knowledge Economy Strategy and Action Plan*, 2013

¹³ Erik Brynjolfsson on Big Data: A revolution in decision-making improves productivity, Feb 2012, <http://mitsloanexperts.mit.edu/erik-brynjolfsson-on-big-data-a-revolution-in-decision-making-improves-productivity/>

¹⁴ We're all being mined for data – but who are the real winners, Guardian, 8th June 2014 www.theguardian.com/technology/2014/jun/08/big-data-mined-real-winners-nsa-gchq-surveillance

generated and shared by people with a particular interest. Tag scanning by consumers to generate real-time maps of the price of goods is one example. Another is Waze, an app which collates real-time traffic information from data submitted via the mobile devices of other drivers. The potential applications of the 'real world web' are still emerging. Some may be dependent on 4G cellular / wireless standards, rather than superfast broadband cable. However, the possibilities created by these twin developments may have important implications for many businesses, affecting, for example, how retail or hospitality businesses understand, follow and engage with customers.

E-learning

Although e-learning has been with us for some time, superfast broadband is now required to access increasingly advanced content and new approaches that exploit improvements in connectivity. E-learning is a broad concept, taking in: formal 'courses'; Massive Online Open Courses (MOOCs); on-line video demonstrations (e.g. of how to use software or fix consumer devices); or helpdesk staff taking over peoples' PCs, to demonstrate how to fix problems or perform certain functions. Superfast broadband offers further scope for fostering on-line learning, be this led by educators, facilitated by business advisors, or achieved via spontaneous mutual support within dedicated web environments. The scope for using e-learning to enable businesses and their staff to acquire skills is attractive both as offering efficient learning solutions and solutions that result in the serendipitous acquisition of web skills as by-product of participation.

SKILLS NEEDS

In their evidence to Parliament, the South Wales Economic Forum argued that: *In line with the roll-out of superfast broadband, skills development for both individuals and organisations is required... Any skills development programme should be developed in co-operation with the private sector and focus on the future rather than current needs of organisations.*'

In this section we look at employers' IT skills needs drawing on e-skills uk's Technology Insights 2012 report. In so doing, we differentiate between the:

- 1,116,000 IT and Telecoms professionals working in the UK, who make up 3.8% of all UK employment
- 4,500,000 Business leaders and managers in the UK who need to exploit the potential of IT for their businesses, equivalent to 15.4% of all employment
- 22 million employees who make use of IT as a tool to support their everyday work life, equivalent to 75% of all employment.

IT and Telecoms professionals

Employment trends - National

Across the UK, there are an estimated 1.55 million people employed in the Information Technology and Telecoms (IT&T) workforce. Of these, around 30% are IT&T professionals in the IT&T sector, 30% are other workers in the IT&T sector and 40% are IT&T professionals in other sectors.

Nationally, Employment in Technology Occupations grew 5% between 2001 and 2010, twice the growth rate for all occupations, with growth fastest being among 'ICT Managers' and 'ICT Strategy and Planning Professionals'. Looking forward, the number of IT&T professionals is also forecast to grow, by 14.5% between 2011 and 2020, or at an average annual rate of 1.62%, nearly twice as fast as growth across the economy as a whole (0.89%).

Hidden within this overall statistic, are a series of sub-trends. For example, in an area of particular local interest, e-skills uk's 2013 report into Big Data Analytics¹⁵ identifies that, *despite the unfavourable economic climate, demand for big data staff has risen exponentially (912%) over the past five years from less than 400 vacancies in the third quarter of 2007 to almost 4,000 in the third quarter of 2012.*

The report goes on to project that, from 2012 to 2017, *the overall increase in demand for the specific types of big data staff analysed in this report ranged from 178% for Project*

¹⁵ Big Data Analytics – An assessment of demand for labour and skills, SAS/e-skills uk, November 2013

Managers to 3363% in the case of big data Developers (1643% for big data Designers, 930% for big data Administrators, 784% for big data Architects, 350% for Data Scientists and 327% for big data Project Managers).

Employment trends - Local

Unfortunately, data on the number of people working as IT&T professionals is not available locally, though we can look at data on employment in the 'IT sector'. Data from Working Futures suggests that employment in the IT sector grew extremely rapidly in HotSW in the 20 years from 1990 to 2010, doubling from 5,700 to 11,700 over this 20 year period. Growth was particularly rapid in the 10 years between 1990 and 2000 (56%), slowing slightly to 31% between 2011 and 2020.

Looking forwards, the projections suggest that growth in this sector is likely to come to a halt and that the number of people employed in IT within HotSW in 2020 will be the same as it was in 2010 (11,700). Within the sector, there is projected to be an increased concentration of higher-level employment, in roles for ICT Managers, IT Strategy and Planning and Software professional roles. The sector is highly educated, with 62% of the workforce holding HE or equivalent level qualifications.

Rosie – I want to check this against the 2012 – 2022 Working Futures Projections, as it's surprising and at odds with the e-skill national forecasts and your LEFM ones for Devon (below). Just waiting for the new license to use the latest data.

Data commissioned by Devon County Council from the Local Economy Forecasting Model also points to rapid historical growth in the IT Services sector (120% from 1993 to 2013) while suggesting that employment in IT Services will grow by 21% between 2013 and 2023, compared to 16% growth across the economy as a whole.

The projections are a bit mixed, although one inference is that employment in specialist IT-focused enterprises may slow, while employment among IT &T experts working across all sectors will continue, at least at the national level.

This chimes with e-skills predictions that there will be a growing need for people with hybrid technical and business capability and that the industry is increasingly favouring workers who have IT skills linked to broader business experience. As a result, the age at which people are being recruited into these IT occupations has been rising and less than 1% of employees in Technology Occupations are now aged under 18. In 2012, 47% of IT&T professionals were aged 40+ years old, whilst the proportion of employees aged 16 to 29 years old had declined from 31% to 19% between 2001 and 2011.

We will look at this section again once the WF data arrives.

The fact that, in 2011, only 18% of the IT workforce were women is a serious concern, particularly as this percentage appears to have declined from 22% in 2001.¹⁶

Skills shortages

Finding applicants with the appropriate skills, qualifications and experience remains a relatively common experience for the sector. A survey of 4,7000 businesses by the National Skills Academy (NSA) for IT showed that one in seven enterprises seeking IT & T staff were having difficulty recruiting and that the problem was particularly acute among firms operating in the IT and Telecoms industry, where just under half (48%) of employers reported having difficulties filling IT&T positions.

IT&T Skills shortages are most frequently associated with 'professional' level openings, and most frequently cited for Programmers / Software developers and Web design and Development staff. As with other industries, difficulties recruiting IT Professionals can have a considerable negative impact on companies' activities, including difficulties meeting customer service objectives and delays in introducing new products and services.

Skills gaps

According to the 2011 NSA for IT survey, around one in ten all employers (11%) were aware of skills gaps among their employees and one third (34%) of these employers reported gaps in the skills of their IT & Telecoms staff.

Within the IT&T sector, 17% of employers reported skills gaps and 71% of these employers reported that they had skills gaps among IT and Telecoms staff. Employers with skills gaps reported that skills gaps were identifiable among approximately 71% of staff holding IT and Telecoms positions. Staff with skills gaps were reported as working at around half (53%) of their maximum potential.

Future Skills Needs

e-skills uk forecasts a need to fill an average of 148,000 jobs each year to 2015 across all IT & T occupations. Around 13% of posts are expected to be filled by people switching job within the IT&T industry with the others filled by people entering the sector for the first time. Of these new entrants, 43% are expected to be people switching from non IT&T occupations, 18% are expected to enter from education and 39% to enter from unemployment or economic inactivity.

According to e-skills uk, the main development need is at, or to, senior level, and centres on developing senior staff with expertise in programme management, supplier management and managing service delivery. There is also a need to up-skill technicians to Levels 3 and 4.

Trying to provide a detailed breakdown of all the skills needed within the sector is beyond the scope of this paper. These are enormously varied and many, such as programming,

¹⁶ E-skills UK, *Technology Insights 2012*

change rapidly. However, it is interesting to note the results of Computerworld's 'IT Forecast Survey' of executives in the United States, which identified the following as the eight top skills areas to which employers would be recruiting in 2014¹⁷

1. Programming/application development - cited as a recruitment priority by 49% of survey participants
2. Help desk/technical support - 37%
3. Networking - 31%
4. Mobile applications and device management - 27%
5. Project management - 25%
6. Database administration - 24%
7. Security - 21%
8. Business intelligence/analytics - 18%

e-skills UK also emphasises that a growing number of basic technology jobs are being performed overseas, resulting in the domestic industry becoming increasingly highly skilled, moving deeper into the board-room, and focusing on activities such as business process analysis, project management, generating and analysing business intelligence and handling more and more complex technology systems. As a result, technology professionals increasingly need not only strong technical skills, but the ability to work with business leaders and managers to understand of how technology can improve business performance alongside project management skills and the capacity to implement business change.

Business Leaders and Managers

The converse of this is true for business leaders and managers, a point made succinctly in e-skills uk's 2009 Sector Skills Assessment, which holds true today.

To support innovation, and to achieve the competitiveness and productivity benefits the UK needs, a significant number of people in every sector – including the UK's four million leaders and managers – need to grasp the strategic implications of technology and have the skills to realise its potential. The UK urgently needs to rapidly move up the maturity curve in terms of attitudes to technology: it should be no more acceptable for those in leadership roles to lack an understanding of technology than it is to lack an understanding of finance.

However, many leaders do not as yet have this expertise. There are direct correlations between technology uptake and both company size and the age of the decision makers in an organisation. Smaller organisations and those run by older people are much less likely to embrace technology, and these segments need more targeted support to improve their

¹⁷ 8 Hot Skills for 2014, http://www.computerworld.com/s/article/9242548/8_hot_IT_skills_for_2014

ability to operate in the digital economy. Companies that do not adopt digital technology miss out on the productivity and competitiveness benefits it offers¹⁸.

The contention, made earlier in this report, that many businesses remain relatively unsophisticated in their use of ICTs and have a long way to travel, appears to be supported by local evidence from the 2012 Heart of the South West Business Survey¹⁹.

This found that while very few businesses (4%) don't use the internet at all, but that most enterprises use the web for relatively basic (if useful) purposes: 92% used it for email, 85% for internet browsing and 58% reported having a basic website. Beyond these core functions, internet use collapses, with just 14% of enterprises reporting having an 'online store' and fewer than 10% reporting engagement in 'advanced e-business' or applying 'integrated [ICT] systems' within their businesses.

Interestingly, the survey shows that many businesses appreciate the potential benefits that more sophisticated ICT use. Half the respondents planned to expand their use of the ICT over the next 12 months, of whom 41% intended to improve their website, 18% planned to introduce other customer options and 17% to increase their online administration systems.

A number of barriers to ICT use were cited, the two most prevalent being that internet connections that were slow or undependable²⁰ (cited by 30% of respondents) and that the type of service / produce being offered by the company was not suitable for e-commerce (28%). Other reasons included 'lack of skilled staff / staff require training' (15%), lack of knowledge of the benefits (10%), customers / trading partners not ready to use e-commerce (9%), lack of internal systems (7%) and not enough advice available (6%).

IT Users

Aside from business leaders & managers and IT & Telecoms professionals, there are many others in the workforce and wider society who may need to acquire IT skills if the LEP's digital economy aspirations are to be realised.

Workforce

e-skills UK calculate that 75% of the UK workforce now make use of ICTs as a tool to support their everyday work life. Describing the variety of ways in which improvements in digital connectivity might affect such a large proportion of the workforce is impossible, so, once again, a number of illustrations will need to suffice.

¹⁸ e-skills uk, 2009, p. 41

¹⁹ Devon Rural Renaissance Survey, 2008

²⁰ It is interesting to note that the proportion citing slow internet connection as a barrier rose from 10% in 2011 to 30% in 2012. This is unlikely to be because internet speeds have slowed. It may be partly statistical, but is also likely to be due to the increasingly data-hungry / sophisticated nature of many internet-enabled applications, which require wider bandwidth to operate effectively.

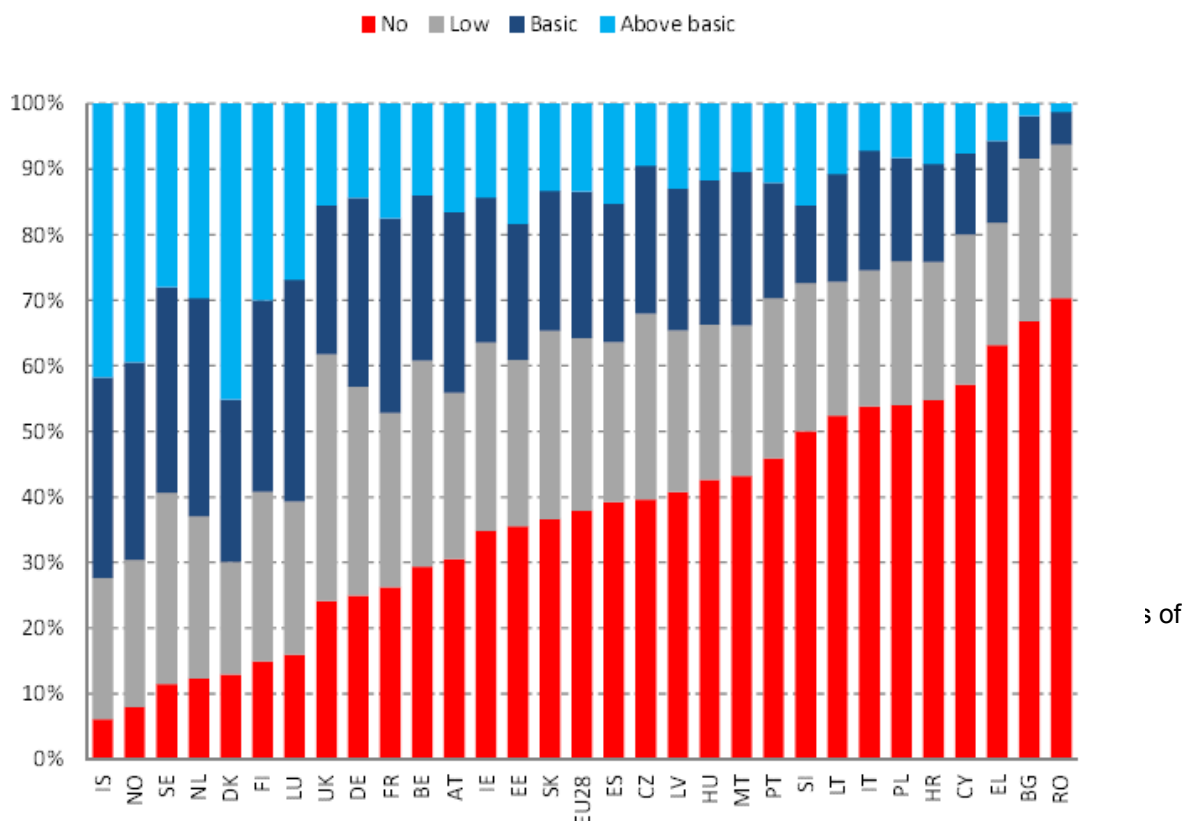
- **Distributed workers** - may need new IT user-skills, e.g. in accessing remote servers, document sharing, video conferencing, synchronising multiple applications and devices;
- **HR staff** - may need new skills to manage distributed workforces, including managing by results, liability mitigation for home-based environments etc.
- **Finance staff** - may need new skills to adapt to e-billing and to maximise the benefits or real-time financial information flows produced by digital systems;
- **Sales / marketing staff** - may need a range of new skills to support the development and implementation of export strategies, which may be result from broadband-enabled businesses extending their markets.

Such changes give rise to a wide variety of skills needs. These may be ICT focused (e.g. on how to use a new programme) or require the acquisition of ICT competencies as part of learning how to perform a wider task. The distinction between the two is blurred. It's interesting, however, to note that the occupational group that employers most frequently identify as lacking both 'Basic Computer Literacy / Using IT' and 'Advanced IT or Software skills' is Administrative / clerical staff. This holds true for both Skills Shortage Vacancies²¹ and Skills Gaps²².

Digital Inclusion

Although we perform relatively well in relation to other EU countries, a large number of people in the UK still lack the key skills required to use computers or the internet effectively and safely. As previously stated, 35% of the UK workforce has low or no digital skills. This figure rises to 42% of the overall population and 62% of 'Disadvantaged People'²³. This last figure is only just above the EU average of 64% and, as Figure 1 shows, well below the best performing, mostly Nordic, nations.

Figure 1: Digital skills of disadvantaged people, 2012 (% individuals)



Nationally, GO ON UK estimate that there are 16m people aged 15 or over in the UK who lack the basic skills to make confident full use of digital tools available to them. In the Heart of the SW, 195,000 people have never used the internet (ranging from 13.5% in Torbay to 14.7% in Plymouth)²⁴.

Alongside adequate connectivity, the possession of basic IT skills, the ability to search for information and to identify between trustworthy and untrustworthy information is now a central determinant of an individual's capacity to access a wide range of goods and services, including those provided by Government.

e-government, the increasing prevalence of e-health and care, the transfer of Universal Credit, job-search other services to a 'digital-by-default' setting, provides further urgency both for ensuring that adequate skills support is provided for this significant proportion of the community alongside improvements in digital access.

The need to address 'digital exclusion' doesn't only focus on those who are out of work. The awareness that people are in work have of the importance that using ICTs to their employability is evident in the findings of a 2011 EU survey which reported that 11% of UK employees regarded themselves as having ICT skills that were 'insufficient for the labour market'.

²⁴ Internet Access Quarterly, ONS, Q1 3013

THE SUPPLY OF QUALIFICATIONS

In this section, we look at the supply of ICT / Digital skills coming into the labour market via the education and training system, though the data is problematic due to the variety of definitions and systems that are used to classify qualifications and sectors of study.

GCSEs

Across England, in 2012/13 there were 57,734 GCSE Entries in IT. Unfortunately data is not readily available at the local level. However, nationally, this is the equivalent of just 1.3% of all GCSE entries. Following a steady decline, the number of entries in this subject stabilised in 2011/12 before picking up in 2012/13.

Table 1: GCSE entries in IT, 2007/8 to 2012/13, England

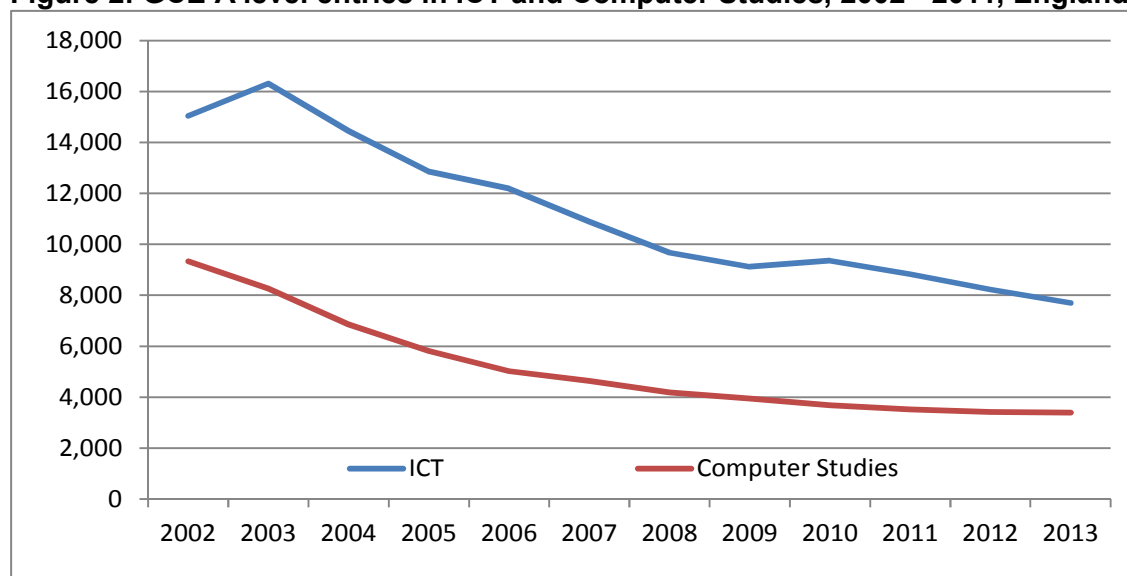
	IT Entries	% of entries in IT
2007/2008	68,392	1.4%
2008/2009	55,230	1.2%
2009/2010	43,363	0.9%
2010/2011	36,162	0.8%
2011/2012	39,213	0.9%
2012/2013	57,734	1.3%

Source: SFR 01/2013

A levels

In 2012/13, across England, there were 7,696 A level entries in ICT and 3,399 entries in Computer Studies. This represents a considerable decline since 2002, when there were 15,037 A level entries for ICT and 9,329 for Computer Studies.

Figure 2: GCE A level entries in ICT and Computer Studies, 2002 - 2011, England



Source: DfE

Locally, it appears that a lower than average proportion of all A Level entries are in these two subjects within HotSW. In 2011/12, there were 66 entries for Computer Studies in HotSW, equivalent to 0.7% of all A Level entries. Nationally 1.2% of all A Level entries were in this subject. Similarly, there were 132 A Level entries in ICT, equivalent to 1% of all A Level entries, while this subject attracted 1.2% of A Level entries nationally.

Table 2 shows that there was significant fall in the number A Level entries in these two subjects between 2010/11 and 2011/12. The number of A Level entries in Computer Studies and ICT within HotSW fell by -30% and -26% respectively in this period while the national decline was much smaller, at -3% and -6%.

Table 2: GCE A-level entries by 16-18 year olds, 2010/11 v 2011/12

	Computer Studies			ICT		
	2010/11	2011/12	% Change	2010/11	2011/12	% Change
Devon	26	17	-35%	59	42	-29%
Plymouth	5	3	-40%	35	24	-31%
Somerset	52	36	-31%	69	46	-33%
Torbay	11	10	-9%	16	20	25%
HotSW	94	66	-30%	179	132	-26%
England	3,326	3,229	-3%	8,190	7,659	-6%

Source: SFR 01 / 2014

The low level of learning in these subjects at both GCSE and A Level is a source of concern for policy makers. In 2012, Education Secretary Michael Gove described the ICT curriculum as a 'mess' and 'demotivating and dull' in a speech setting out plans for a new curriculum in computer science and programming, that would create young people "able to work at the forefront of technological change".

"Instead of children bored out of their minds being taught how to use Word or Excel by bored teachers, we could have 11-year-olds able to write simple 2D computer animations," he explained.²⁵

A new national curriculum will be introduced in September 2014, which moves the focus for use of application to ensuring that children have practical experience of designing and writing computer programs, and that they can understand the fundamental principles of computer science.

The dramatic upturn in GCSE entries in 2012/13 shown in Table 1 may be related to the fact that the current national curriculum for ICT at key stages 3 and 4 was disapplied from 1 September 2012, leaving schools free to develop their own curriculums for ICT in this year. The advent of the new curriculum has been welcomed by industry, including companies such as Google and Facebook, and provides an opportunity to foster a new interest and

²⁵ School ICT to be replaced by Computer Science programme, BBC, 11th January 2012, <http://www.bbc.co.uk/news/education-16493929>

excitement in this area of study. If HotSW LEP wishes to build a ‘Silicon South West, it may wish to build on this, through supporting curriculum enrichment, IAG, Silicon ambassadors and other employer-led measures to excite young people in this area of work and learning.

SFA funded learning

Data from the SFA is available for the number of people undertaking programmes focused ‘Business Information Technology & Telecommunication’. In 2011/12, within HotSW, a total of 5,870 Learning Aims were taken up under this heading. This equates to 2.2% of all Learning Aims and 5.4% of all sector-specific Learning Aims²⁶.

Table 3: Volume of SFA Learning Aims in Business Information Technology & Telecommunication taken up learners residing in HotSW, 2010/11 and 2011/12

	2010/11	2011/12	Vol Change	% Change
East Devon Total	340	350	10	2.9%
Exeter Total	1,040	470	-570	-54.8%
Mendip Total	400	320	-80	-20.0%
Mid Devon Total	200	170	-30	-15.0%
North Devon Total	470	360	-110	-23.4%
Plymouth Total	1,040	1,090	50	4.8%
Sedgemoor Total	580	590	10	1.7%
South Hams Total	200	180	-20	-10.0%
South Somerset Total	540	530	-10	-1.9%
Taunton Deane Total	290	370	80	27.6%
Teignbridge Total	660	360	-300	-45.5%
Torbay Total	630	640	10	1.6%
Torridge Total	290	240	-50	-17.2%
West Devon Total	360	160	-200	-55.6%
West Somerset Total	30	60	30	100.0%
	7,070	5,890	-1,180	-16.7%

Source: The Data Service

Table 3 shows that the volume of Learning Aims funded under this heading fell by -16.7% between 2010/11 and 2011/12. Particularly large declines were registered in Exeter (-55%), West Devon (-55%) and Teignbridge (-45%).

The vast majority of these Starts (92%) were funded under the SFA’s ‘Employment and Training’ budget, covering provision delivered within colleges and training providers.

There were 400 Apprenticeship starts in this broad sector area and just 70 Workplace Learning starts, compared to 590 in the previous year. That said, it is important to bear in mind that delivery of workplace learning (apart from Apprenticeships) has declined throughout this parliament, with the shift away from Train to Gain.

²⁶ Large numbers of Learning Aims (e.g. literacy and numeracy) are not sector-specific and are therefore categorised as being either ‘Not Applicable’ to any particular sectors or as ‘Unknown’

Table 4: Volume of Learning Aims by learning type, Business Information Technology & Telecommunication, HotSW residents, 2010/11 and 2011/12

	2010/11	2011/12	Change - Vol	Change - %
Education & Training	6,120	5,340	-780	-13%
Apprenticeships	370	400	30	8%
Workplace Learning	590	70	-520	-88%
Community Learning	-	-	0	
Total	7,080	5,810	-1,270	-18%

Source: The Data Service

Apprenticeships

Disaggregated data showing the number of Apprenticeships in ICT alone is available.

Nationally, in 2012/13, there were 14,000 Apprenticeship starts in ICT²⁷, equivalent to 2.8% of all Apprenticeships. Table 5 shows that this figure has fallen from 19,400 in 2010/11, a year in which starts in ICT made up 4.3% of all starts.

In HotSW, the proportion of ICT Apprenticeships is much lower. In 2012/13, there were just 180 Apprenticeship starts in ICT, equivalent to 1% of all Apprenticeship starts. Table 5 also shows that the proportion of Apprenticeships in ICT within HotSW has been below the national average since 2005/06.

Table 5: Apprenticeship Starts in ICT, HotSW v England, 2005/6 to 2013/14

	HotSW	HotSW	England	England
	ICT App Starts	% of starts in ICT	ICT App Starts	% of starts in ICT
2005/06	50	0.8%	6,500	3.8%
2006/07	40	0.5%	5,700	3.1%
2007/08	130	1.6%	6,700	3.0%
2008/09	90	1.0%	8,800	3.7%
2009/10	180	1.6%	12,500	4.5%
2010/11	260	1.6%	19,400	4.3%
2011/12	230	1.2%	18,400	3.6%
2012/13	180	1.0%	14,000	2.8%
2013/14 (Q 1 & 2)	120	1.6%	6,000	3.1%

Source: ILR / FE Data Library

Higher education

Unfortunately, data on the number of applications received by Higher Education Institutions from people wishing to read computer science is wrapped up in a single heading – ‘Mathematical & Computer Science’. This is also true for the number of applications that are accepted.

²⁷ Based on the Ofqual ‘Tier 1’ Subject area