Skills Investment Plan
For Scotland’s ICT & Digital Technologies sector
It is an exciting time for Scotland’s ICT and digital technologies sector as we prepare to implement Scotland’s Digital Future – Digital Economy Strategy. This Scottish Government strategy sets out an ambitious plan to ensure that Scotland is prepared for its digital future and skills development is identified as being an integral component.

Globally ICT and digital technologies are booming and Scotland is well-placed to take advantage of the new opportunities created. There is an unprecedented demand for ICT and digital technology professionals and across Europe the number of jobs is growing by more than 100,000 each year. In order to take advantage of the opportunities that exist, we must continue to respond by providing the right people with the right skills and expertise to enable the sector to continue to grow and attract overseas investment. We must ensure that Scotland continues to be seen as a key player in areas such as big data, informatics and digital health where we have already demonstrated considerable strength and expertise.

Delivering the Skills Investment Plan (SIP) for Scotland’s ICT and digital technologies sector has been facilitated by Skills Development Scotland, working in partnership with key skills groups and industry stakeholders. The SIP development has involved reviewing future skills and employment demands, in order to help the sector respond to and embrace the skills challenges that exist in a dynamic and rapidly evolving sector.

Now, more than ever, it is imperative that stakeholders, education providers and public bodies work together with industry to ensure that skills investment across the sector is targeted effectively and achieves maximum results.

Let’s work together to make Scotland a world-class digital nation by 2020.

A key driver of this success has been Scotland’s reputation for skills which has been achieved through the strength of the university sector, and our ability to produce highly capable graduates. However, in such a dynamic industry, and with so many competitor countries investing in their ICT and digital technologies skills base, we can’t afford to be complacent.

Up to 11,000 job opportunities could be available each year in Scotland, and it is imperative that we match the sector’s ambition for growth with highly-focused investment in skills, to ensure that Scotland maintains its prominent position and maximises its employment and export potential.

This document sets out the strategy for how we intend to achieve this aim. It demands a collaborative approach, with stakeholders and industry working together to extend the talent pool to ensure that Scotland continues to develop itself as a world-class location from which ICT and digital technology companies operate. This will be achieved by deepening the educational capabilities to produce and retain high-ranking performers, positioning the sector as a positive career destination for our young talent, and by fostering a culture that supports exports, innovation and entrepreneurship.

As Chair of the ICT and Digital Technologies Skills Group, I’m excited about the global opportunities that exist in this sector, and the impact that our industry will have on jobs and economic performance throughout Scotland in the years ahead. Let’s focus on putting the talent pool in place that will make the most of these opportunities.
The ICT and digital technologies Skills Investment Plan (SIP) is a partnership document which has been facilitated by Skills Development Scotland (SDS) on behalf of Scottish Government. SDS has worked closely with industry to develop this ICT and digital technologies SIP and will continue to work with industry and public sector partners in its implementation.

The development of the SIP has been informed and guided by an industry-led steering group which has included representatives from Amazon, JP Morgan, Lockheed Martin, ScotlandIS, e-Skills UK and the Technology Advisory Group, as well as from partners from education and the public sector.

The purpose of the SIP is to:

- Validate and bring clarity to the scale and nature of the skills issues which face the sector
- Create direction and bring focus to the nature of the response required by the public sector and industry, on the priority skills issues
- Provide a framework for public sector and private sector investment to develop skills provision to meet industry needs.

The SIP development has been sector-led and published by SDS. It has been informed by a review and synthesis of existing research, in particular e-Skills UK 'Technology Insights' and ScotlandIS 'Scottish Technology Industry Surveys'. It has been validated through extensive employer and stakeholder consultations.

The key stages in the SIP development process are set out in Figure 1 below and the process is outlined in more detail in Appendix 1.

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**Figure 1: SIP development process**

<table>
<thead>
<tr>
<th>Scale of the sector/growth ambition</th>
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<tbody>
<tr>
<td>Supply side mapping</td>
</tr>
<tr>
<td>Review evidence of skills needs</td>
</tr>
<tr>
<td>Identify skills priorities for growth</td>
</tr>
<tr>
<td>Test with industry</td>
</tr>
<tr>
<td>Publish and launch SIP</td>
</tr>
</tbody>
</table>

The development of the SIP builds on the work of the ICT Advisory Group and has been closely aligned with Scotland’s Digital Future – Supporting the Transition to a World-leading Digital Economy which outlines the Scottish Government’s ambition to make Scotland a world class digital nation by 2020. Echoing this strategy the SIP identifies a skills ambition for digital technologies in which:

- Scotland has the skills required to develop and exploit its strengths in areas such as digital health, care and big data
- Growth sectors have access to the ICT professional skills they require to embrace digital technologies
- There is close collaboration between industry, Government agencies and the education sector to meet the skills needs of the sector.
The importance of the sector

The Scottish ICT and digital technologies sector is of crucial importance to the Scottish economy and a strong infrastructure is needed to support future prosperity.

Economic contribution

In its own right the ICT and digital technologies sector, which includes software development, telecoms and ICT services, contributes £8 billion GVA, accounting for 3% of the Scottish economy. The sector is an increasingly important part of the Scottish economy and also plays an underpinning role in terms of driving the competitiveness of other key sectors.

Business base

This dual role is reflected in the workforce as there are more than 73,000 ICT and digital technology professionals employed within the sector directly and in digital technology roles in other businesses across the Scottish economy, as illustrated in Figure 2 below:

![Figure 2: Employment breakdown of ICT and digital technology professionals](image)

<table>
<thead>
<tr>
<th>TOTAL – ICT and digital technology professionals</th>
<th>73,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employed within the ICT and digital technologies sector</td>
<td>29,000</td>
</tr>
<tr>
<td>Employed in other sectors</td>
<td>44,000</td>
</tr>
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</table>

In its own right the ICT and digital technologies sector is thriving and from 2010 to 2013, the number of businesses operating in the sector increased by 3.6% to 6,500. Whilst the business base is dominated by micro businesses and SMEs, multi-nationals are of importance to the sector, as the largest percentage of the workforce are employed in businesses with 200 or more employees.

Export markets and foreign investment

Digital technologies account for a significant proportion of Foreign Direct Investment (FDI) in the UK, with software related investment making up around 25% of all FDI projects. The Ernst and Young European Investment Monitor indicates that Scotland has secured a much higher share of overall UK investment in this area, with recent commitments from Atos, Capgemini and CGI testament to this success.

Export markets have also become increasingly important and the 2013 ScotlandIS Technology Survey indicates that over half of the respondents were currently exporting, which represents an increase of 14% over the last three years. Europe and North America were cited as the most important markets for exporting businesses. Digital technologies are widely recognised as a driver of innovation and international trade and consequently many ICT and digital technology businesses have an international outlook and view export markets as a key channel for their products and services.

Drivers of change

The dynamic nature of digital technologies means there are continually new products, processes and business models being developed and this has an impact on the skills needed to take advantage of these. In addition, there are a number of wider economic and industry trends that will have longer term skills implications and which are cross cutting. The implications of these drivers on skills needs are highlighted in Figure 3.

![Figure 3: Drivers of change for ICT and digital technologies](image)

<table>
<thead>
<tr>
<th>Driver</th>
<th>Description</th>
<th>Skills implication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pace of change</td>
<td>The ICT and digital technologies sector is dynamic and fast changing and many of the current business products or models did not exist a few years ago.</td>
<td>Constant change in skills requirements of the workforce. Education system needs to be agile enough to be able to respond to the changing needs and expectations of businesses.</td>
</tr>
<tr>
<td>Increased digital investments</td>
<td>Increased numbers of businesses, across all sectors, are investing more to enhance their use of technology.</td>
<td>Creates an increased demand for technology skills across a range of sectors. This can act as a catalyst for growth and job creation. To assist businesses in adapting to changes in technology there is a need for core competencies and technology awareness to be improved across all sectors.</td>
</tr>
<tr>
<td>Increased contracting-out</td>
<td>A trend towards increased contracting out of services to countries with the ability to provide a lower cost service.</td>
<td>A high quality skilled workforce becomes critical if Scotland is to continue to be viewed as a location which can attract, and support high value jobs. The development of the talent pool needs to be aligned with inward investments.</td>
</tr>
<tr>
<td>Increased importance of security</td>
<td>Cyber crime is a driver of innovation within the industry. It also responds to the requirements of key client sectors such as the financial services industry. The ability to protect the integrity of a product or process in a global environment is a key success factor.</td>
<td>A requirement for specialist skills to be developed. Education system needs awareness and capacity to respond to this issue as it cuts across all sub-sectors of ICT and digital technologies.</td>
</tr>
</tbody>
</table>
Key skills issues

A review of labour market intelligence and research, and stakeholder consultation has identified a range of key skills issues, and challenges for Scottish ICT and digital technologies.

However these are not issues only for Scotland but are echoed across other countries in Europe and the USA. The European Commission’s Grand Coalition for Digital Jobs recently indicated that the demand for talent significantly outstrips supply. Europe alone could face a shortage of up to 800,000 ICT and digital technology professionals.

Similarly the under supply of talent is an issue for the Irish economy and more than half of their recent high level ICT and digital technology skills needs have been filled through inward migration. This increased international demand for ICT and digital technology professionals creates additional challenges for Scotland which must be addressed in order to remain competitive in a global market.

ICT and digital technologies are an enabler of growth

Inward investment and indigenous company growth from within the sector is already creating an increased demand for digital technology skills. ICT and digital technologies are also an important enabler across the whole economy and the positive impact of technology in driving innovation and growth can be seen in engineering, defence and energy. The increasing adoption of digital technologies by businesses in other sectors creates significant job opportunities and drives increased demand for skills in relation to the use of ICT.

- Financial services
  ICT and digital technology skills for information security systems, asset management systems and data mining and analysis have become increasingly important for the sector. In addition financial services requires individuals with the skills to utilise technology to deliver more sophisticated products and services such as for internet, banking, social media and mobile offerings.

- Life sciences and health
  Digital healthcare is an increasingly important area of opportunity which requires individuals with ICT and digital technology skills to be able to store, process, and analyse large amounts of information and data. In addition research and development can be significantly enhanced by the new technologies which are being developed.

- Creative and cultural industries
  ICT skills are required for the manipulation of creative content in digital music, piracy, copyright and social media. Broadcasting business requires the skills to diversify into new platforms in products and services, whilst publishing and journalism are becoming increasingly digitally focused. In crafts there is an increasing use of technology in design.

The demand for individuals with ICT and digital technologies skills is predicted to grow

Overall the number of people employed in ICT and digital technology roles is forecast to increase by 15% to 84,000 by 2020.\(^1\) At the same time, the profile of the current workforce is ageing. The proportion of 16 to 24 year olds working in Scotland as IT & telecoms professionals is half that of other occupations. This creates exciting job opportunities as there is a need to replace those employees leaving the sector, as well meeting the demand from future growth. Forecasts from e-Skills UK suggest that there could be as many as 11,000 job opportunities each year in ICT and digital technology roles.

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\(^1\) “Technology Insights Scotland 2012”, e-Skills UK, 2012
ICT and digital technologies offer highly paid and rewarding career opportunities. Almost three quarters of employees in the sector have attained a higher education or equivalent qualification. Research by e-Skills UK also indicates that median full time earnings for ICT and digital technology roles are £38,500, considerably higher than the Scottish average of £25,500.

Looking to the future, job growth is expected to be particularly concentrated in areas such as software development, software engineering and web development - there has already been a 50% increase in demand for software professionals over the last ten years. Demand for graduates is also predicted to increase as businesses continue to look to employ candidates straight from university, favouring those who can bring some experience as well as those who combine technology and commercial skills.

The success of the sector means that many companies are facing challenges in recruiting enough people with the right skills. This increased demand for employees has created recruitment challenges for ICT and digital technology businesses and other businesses across the economy. Despite the health of the sector and the attractive career prospects it offers, many businesses are currently reporting challenges in recruiting enough highly skilled individuals to meet their growth ambition and potential. In response to this, ICT and digital technology companies have already indicated that they have been reviewing and adopting new recruitment strategies, including an increased focus on under-graduate and graduate placements and recruiting overseas talent. There are positive signs that this will continue with businesses demonstrating a strong desire to examine new recruiting models which will help attract more people for the future needs of the sector.

Promote new entry routes into ICT and digital technology careers. Whilst ICT and digital technology companies tend to prefer employing graduates, there is growing recognition of alternative entry routes into the sector through interventions such as transition training and Modern Apprenticeships. ICT and digital technology businesses have indicated interest in the development of an intensive transition training model which would allow individuals with transferable skills to be re-skilled. This would support individuals in taking advantage of the immediate need for talent which the sector is currently experiencing.

Similarly there is recognition that Modern Apprenticeships (MAs) are a valuable option for the sector. MAs offer a route for individuals to obtain skills, qualifications and experience. In addition to providing financial support to assist businesses to develop a skilled workforce, the MA programme also supports young people to develop employability skills and gain work experience. Working through industry ambassadors these benefits should be highlighted to ICT and digital technology businesses to generate greater awareness and understanding. This will lead to wider adoption and complement graduate recruitment. Feedback from businesses engaged with the Information Technology Professional (ITP) MA cites excellent experiences and outcomes. There have been positive actions from leading businesses, including Microsoft, currently working towards a target of 2016 IT MAs by 2016.

Up-skilling the workforce. ICT and digital technology professionals already working in the sector have to continually up-skill in order to keep pace with new developments in areas such as e-commerce and the increasing focus on big data, data analytics and cybersecurity. The rapidly evolving needs of the industry have the potential to create skills gaps in the ICT and digital technologies workforce. The ability for staff to refresh and renew their skills and enable individuals to take part in Continuous Personal Development (CPD) will be important in maintaining the competitiveness of the skills base. Up-skilling the existing workforce to embrace new opportunities is also an important part of responding to the immediate need the sector faces.

Broadening the talent pipeline. Addressing the immediate skills challenges of ICT and digital technology businesses is important but must be complemented by a longer term strategy that ensures sufficient numbers of young people come through the education system. At a time when the Scottish ICT and digital technologies sector is forecast to grow and there is increasing demand for staff with high level digital technology skills, there is clear evidence that the talent pipeline in Scotland needs to expand to meet this demand. More young people should be encouraged to study computing related subjects at college and university and redressing this balance is crucial to ensure the competitiveness of Scottish companies both within the ICT and digital technology sector and beyond.

In particular there is a need to arrest the decline of students taking computing courses at school. Data from SQaQ shows that over the four year period to 2012 there was a 27% decline in computing Standard Grade and a 17% decline in computing Intermediate 1. Similarly during this period the number of teachers with computing studies as their main subject area decreased by 13.8%. This lack of dedicated teaching provision continues to be an issue.

However whilst computing science as a subject is important for the industry, there is growing recognition that a wide range of disciplines and in particular STEM subjects, can lead to a career in ICT and digital technologies. It is important that young people have the opportunity to develop technology skills and industry awareness across all parts of the curriculum. Broadening the talent pipeline and addressing these longer term challenges will require co-ordinated action across a number of areas. This will include stimulating demand from young people and learners; ensuring adequate teaching capacity in schools, colleges and universities and ensuring more college and university places are available to meet an increased demand. Part of the solution to increasing interest in the sector lies in rolling out industry supported extra-curricular provision that supports young people in developing ICT and digital technology skills and careers awareness. There are already excellent examples of computing clubs such as CoderDojo and Computing Clubs for Girls, but this provision needs to be extended and made available more consistently across Scotland.

Connecting employment and education. A key challenge for the skills system is to align the delivery of a high-quality, industry informed curriculum, with opportunities for young people to gain real industry experience. Engagement with employers has emphasised the importance of gaining experience by ‘learning on the job’ through industry placements and internships. These offer excellent opportunities for graduates to better understand the current needs of industry and embedded entrepreneurial attitudes and behaviours.

Concerted action and promotion is required to enable greater participation from students and from a wider range of businesses. In particular industry should be encouraged to have greater involvement in the education system. In particular industry should be encouraged to have greater involvement in the education system and play a more active role in shaping the curriculum. Industry and education should also be encouraged to work together to support learners to put their innovative ideas into practice and to develop entrepreneurial and business skills.
An example of an industry and education collaboration is the proposed Data Lab Innovation Centre which will be a collaboration between the Scottish Informatics and Computing Science Alliance (SICSA) and industry. The aim of the proposal is to understand and address the current and future skills needs of industry through continuing and professional development, undergraduate and postgraduate education. This will be an industry led project and will offer opportunities for businesses to engage with universities and colleges to commercialise research and develop knowledge exchange opportunities.

Responding to changing industry needs

The sector is dynamic and fast-moving and this is reflected in the pace at which demand for skills can change. This pace of change however, can present a challenge for the education system. Colleges and universities need to be able to keep pace with the changing needs and expectations of businesses and, where appropriate, be sufficiently agile to respond effectively. Research collated during the SIP development process has highlighted the need for good quality labour market information to be developed, packaged and communicated on a regular basis to help educators keep abreast of changing skills demand. Similarly it is important that employers across the sector have the opportunity to engage in curriculum design in schools, colleges and universities. Creating effective industry and education partnerships will support learners to develop ICT and digital technology skills as well as a better understanding of the range of career opportunities available.

Increasing the number of women in ICT and digital technology roles

Women are under represented in ICT and digital technology occupations across the sectors in Scotland. Participation rates of females in the workforce has declined over a ten-year period to 2011 from 30% to 17% and the number of female acceptances onto ICT and digital technologies related higher education courses have tended to be significantly lower than for males. This represents a potential loss of talent to the sector, but with appropriate targeted intervention there exists a prime opportunity to respond to the needs of the sector by encouraging greater female participation. Examples of good practice can already be seen from the work undertaken by the Scottish Resource Centre for Women in Science, Engineering and Technology and this should be built upon. A concerted effort is required by industry, education and the public sector working together to promote positive role models and eliminating the perceived barriers which prevent many women from pursuing ICT and digital technology careers.

Awareness and understanding of careers in the ICT and digital technologies sector should be increased and the wide range of high-value employment opportunities accurately reflected. In addition, reflecting the varied progression pathways into the sector from other disciplines such as maths and sciences is an important message to communicate. Key to this is changing and informing perceptions of careers influencers (parents, teachers and careers and employment advisers) who play an important role in encouraging young people to consider computer and other digital related qualifications and careers.

Raising the attractiveness of the sector

A key strength of the Scottish ICT and digital technologies sector is that it sits at the forefront of innovation. Industry and partners should work together to promote these positive messages to attract potential new entrants. In particular this vibrancy should be communicated to young people who are under represented in the sector, and who can have narrow perceptions about digital technology related subjects and careers.

The vision of the SIP is for Scotland to be viewed as a world-class location for ambitious ICT and digital technology businesses to be able to develop, invest and grow by having access to a talent pool with exceptional ICT and digital technology skills.

Figure 4: Skills Investment Plan vision

An action plan to support this vision has been developed by working in partnership with industry and stakeholders. It is structured around two strategic objectives set out in Figure 4 below:

**OBJECTIVE A**
Attract more talent today: Action to support businesses to meet their immediate skills needs

**OBJECTIVE B**
Closing the gap: Action to broaden the talent pool for the sector and better align supply with industry demand

Theme 1: Responding to the immediate need for ICT and digital technology skills
Theme 2: Broadening the future talent pipeline for ICT and digital technology skills
Theme 3: Working together to make the education system more responsive to the needs of employers
Theme 4: Raising the profile of the ICT and digital technology sector and careers

"Supporting Scotland’s vision to be a world-class location for ICT and digital technology"
Developing an action plan

OBJECTIVE A
Attracting more talent today
Theme 1: Responding to the immediate need for ICT and digital technology skills

The impact of the immediate skills needs has been identified as a key issue for the ICT and digital technology sector, and one which has the potential to limit future growth. A range of short-term measures have been identified which will run concurrently while action is taken to broaden the talent pipeline in the longer term. This will include interventions such as:

- developing an industry-led talent academy model, which will be designed to provide transition training to individuals and provide them with the skills to access ICT and digital technology jobs
- supporting the uptake of CPO and workforce development as a means of up-skilling the current workforce to be able to take advantage of the immediate opportunities
- assisting businesses to widen their talent pool by supporting their talent attraction strategies. This could include transition training, encouraging more businesses to engage with vocational entry routes, recruitment of overseas talent and the specific targeting of women and women returners
- develop a targeted marketing campaign to raise awareness of skill shortage roles aimed at individuals within, and outside Scotland.

OBJECTIVE B
Closing the gap
Theme 2: Broadening the future talent pipeline for ICT and digital technology skills

Addressing the imbalance of skills supply with industry demand is an area which will not elicit immediate results, but it is a vital component of the wider skills strategy. The domestic skills supply requires to be developed through a variety of mechanisms including those intended to generate interest in ICT and digital technology careers, through to those which will increase the capacity for the education system to deliver ICT and computing related qualifications.

Key features of this action will include:

- interventions which will develop the capacity and infrastructure required to support additional ICT and computing related education delivery. This will include engaging with local authorities to encourage discussions about the decline in dedicated computing teachers
- understanding the supply and demand for ICT and digital technology provision and supporting additional capacity at undergraduate and postgraduate level where appropriate
- undertaking research to understand the progression routes into ICT and digital technology roles from other subject disciplines
- targeted promotion of the existing MA frameworks to young people, careers influencers and employers, and to explore employer demand for the development of additional and higher-level MA frameworks
- reviewing existing good practice to develop and promoting existing initiatives for Developing Scotland’s Young Workforce which indicates a two way relationship is required. Businesses are encouraged to become more active participants in the education and curriculum development process. Fostering sustainable relationships with industry at a regional and national level will support schools, colleges and universities to develop a future workforce which is aligned with future need.

Key areas which will be addressed include:

- review existing good practice to develop mechanisms which encourage employers to engage with schools, colleges and universities and which support learners to develop ICT and digital technology skills and better understanding of career opportunities
- undertaking research to fully understand the supply and demand for ICT and computing related subjects at all levels
- communicating demand effectively through the skills system to build agility and responsiveness
- developing and promoting existing student placement programmes to support understanding of the business environment
- achieving better outcomes from the existing education provision for businesses.

Theme 3: Working together to make the education system more responsive to the needs of employers

Ongoing interaction between industry and education is vital to ensure that curriculum reflects the changing needs of a fast moving industry. The importance of business working more closely with the education system is also a key feature of the Commission for Developing Scotland’s Young Workforce which indicates a two way relationship is required. Businesses are encouraged to become more active participants in the education and curriculum development process. Fostering sustainable relationships with industry at a regional and national level will support schools, colleges and universities to develop a future workforce which is aligned with future need.

Key areas which will be addressed include:

- develop a coordinated educational promotional strategy that highlights ICT and digital technology career opportunities
- identify and share best practice from the wide range of initiatives aimed at promoting digital technology careers and skills to young people within schools
- communicate tailored labour market information and careers advice to key target groups and individuals regarding the opportunities available in digital technologies roles.

Areas of early action which have been identified include:

- in partnership with industry deliver a digital technologies focused ‘Make Young People Your Business’ campaign to promote the benefits of employing young people. A key feature will be to raise awareness of the alternative entry routes such as through the MA programmes and placements schemes
- building on the work of Scottish Women in Technology (SWIT) and the Scottish Research Centre (SRC), develop interventions which specifically raise the profile of ICT and digital technologies to women and encourage more women to access ICT and digital technology opportunities
- working with industry, establish an infrastructure project which increase access to computer clubs and extra-curricular computing activities across Scotland.

Theme 4: Raising the profile of the ICT and digital technology sector and careers

A key challenge for the SIP is to effectively communicate ICT and digital technology career opportunities to young people, women, careers influencers and stakeholders. The objective is to ensure that the profile of the industry is fully represented and understood, in order to support informed choices and decisions by individuals, reward investors and stakeholders.

Key areas which will be addressed include:

- develop a coordinated educational promotional strategy that highlights ICT and digital technology career opportunities
- communicating the benefits of ICT and digital technology careers to a wider audience
- work with the Scottish Government to ensure that ICT and digital technology careers are included as part of the Skills for Scotland campaign
- encourage partnerships with industry, employers and training providers to co-produce realistic and relevant ICT and digital technology careers learning resources and materials
- develop a range of awareness raising materials for use within schools, colleges and universities
- develop a social media strategy that ensures the content is engaging and relevant for a wide audience
- work with national and local partners to develop and implement a plan to raise awareness of the opportunities available in digital technologies roles
- develop and promote existing initiatives for Developing Scotland’s Young Workforce which indicates a two way relationship is required. Businesses are encouraged to become more active participants in the education and curriculum development process. Fostering sustainable relationships with industry at a regional and national level will support schools, colleges and universities to develop a future workforce which is aligned with future need.

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4 Developing an action plan continued
5 Action plan
6 Monitoring

Appendices & Acknowledgements
3 Key skills issues
2 The importance of the sector
1 Purpose of the Skills Investment Plan
Home page
The action plan which is presented details the key actions which will be undertaken to support the growth ambition of the ICT and digital technologies sector.

It has been designed to provide a framework for private and public sector intervention, whilst remaining flexible to respond to the evolving nature of the sector and to new opportunities as they arise.

A key feature of the action plan will be to ensure that it aligns with future industry demand by commissioning and utilising robust Labour Market Information and sector research.

A concerted and collaborative approach is fundamental to the successful delivery of this strategy. This will involve a range of partners and industry working together to progress and implement the actions. In particular there will be an emphasis on industry input and industry-led interventions where appropriate.

### Theme 1: Responding to the immediate need for ICT and digital technology skills

**Objectives:**
1. Increase the immediate pipeline of talent to meet current ICT and digital technology skills needs
2. Supporting the up-skilling of the ICT and digital technology workforce

<table>
<thead>
<tr>
<th>Action</th>
<th>Description</th>
<th>Expected outcomes</th>
<th>Key partners</th>
<th>Inception timescale</th>
</tr>
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<tbody>
<tr>
<td>Industry led talent academy model</td>
<td>Develop full business plan for industry led regional talent academy models. Implement talent academy models in Lowland Scotland and Highlands to support employers to recruit 200 individuals to meet their immediate skills needs. Evaluation of initial model and subsequent roll-out to support 750 trainees over a two year period.</td>
<td>Reduction in the number of ICT/digital technology businesses citing unfilled vacancies.</td>
<td>e-Skills UK, FE, HE, Industry, ScotlandIS, SDS, HIE, SE</td>
<td>Spring 2014, Summer 2014, 2014 - 2016</td>
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<td>Supporting skills development in the workplace</td>
<td>Recruit ICT and digital technology skills development advisers targeting 40 companies to provide workforce development support. Establish skills development fund to support professional ICT and digital technology skills development in SMEs. Mapping and promotion of online training interventions via ‘Industry hub’ on Our Skillsforce. Broadening the talent pool by supporting businesses to identify individuals with a strong aptitude for technology roles.</td>
<td>Reduction in the number of ICT/digital technology businesses citing skills gaps in their current workforce. Increased numbers of ICT/digital technology businesses training their existing workforce.</td>
<td>HIE, SE, SDS, ScotlandIS</td>
<td>Summer 2014, Spring 2014, Summer 2014</td>
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<tr>
<td>International talent attraction</td>
<td>With employers, establish a package of support (face to face, webinars and online) to support ICT and digital technology businesses recruit overseas talent. Deliver a targeted marketing strategy including jobs fair events and promotional materials aligned with industry identified skills shortages.</td>
<td>Reduction in the number of ICT/digital technology businesses citing unfilled vacancies.</td>
<td>Industry, HIE, SE, Local Authorities, Talent Scotland, ScotlandIS</td>
<td>Autumn 2014, Summer 2014</td>
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</tbody>
</table>
### Objectives:
1. To encourage more young people to choose a career in the ICT and digital technologies sector
2. To arrest the decline in the number of individuals studying ICT and computer related qualifications at school, FE and HE

### Theme 2: Broadening the future talent pipeline for ICT and digital technology skills

#### SCHOOLS: Support the delivery of ICT/ digital technology related education

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#### YOUNG PEOPLE: Learning and using ICT/Digital technology skills

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<th>Action</th>
<th>Description</th>
<th>Expected outcomes</th>
<th>Key partners</th>
<th>Inception timescale</th>
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#### COLLEGES/ UNIVERSITIES: Increasing ICT and digital technology provision

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<th>Action</th>
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<th>Expected outcomes</th>
<th>Key partners</th>
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#### ALL: Developing entrepreneurial skills and culture

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Theme 3: Working together to make the education system more responsive to the needs of employers

Objectives:
1. Ensure the education system is aligned with the needs of businesses for ICT and digital technology skills
2. Increase the number and relevance of graduates available to enter the ICT and digital technology sector
3. Improve the collaborations between industry and education

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<th>Action</th>
<th>Description</th>
<th>Expected outcomes</th>
<th>Key partners</th>
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<tbody>
<tr>
<td>SCHOOLS/ COLLEGES: Wood Commission/ Curriculum development</td>
<td>Explore best practice and encourage the establishment of national/regional tripartite groups to facilitate industry, school, FE and HE engagement</td>
<td>Industry cites less skills issues with ICT/digital technology related graduates</td>
<td>Education Scotland, HE, FE, Local Authorities, SICSA, SFC, Schools, Industry</td>
<td>Autumn 2014</td>
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<tr>
<td>COLLEGES/ UNIVERSITIES: Internships, work placements and graduate recruitment</td>
<td>Deliver 750 work placements for HE/FE students through e-placement Scotland by 2016</td>
<td>Industry cites less skills issues with ICT and digital technology related graduates</td>
<td>e-Skills UK, e-Placement Scotland, Industry, FE, HE, SFC, SICSA, ScotlandIS</td>
<td>Autumn 2014</td>
</tr>
<tr>
<td>ALL: Work placement for educators</td>
<td>Extend/develop work placement and knowledge exchange opportunities for educators in schools, FE and HE</td>
<td>Industry cites less skills issues with ICT and digital technology related graduates</td>
<td>Education Scotland, Industry, FE, HE, Local Authorities, SFC, SICSA, ScotlandIS</td>
<td>Spring 2015</td>
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</tbody>
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Theme 4: Raising the profile of the ICT and digital technology sector and careers

Objectives:
1. To communicate and market a sector profile which ensures that stakeholders are aware of the contribution that ICT and digital technologies makes to the Scottish economy
2. To ensure individuals and careers influencers (parents, teachers and careers advisers) are aware of the careers opportunities in ICT and digital technologies

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<th>Key partners</th>
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<tr>
<td>Improving awareness of ICT and digital technology careers</td>
<td>Develop bespoke Labour Market Information (LMI) and communication strategy to support teachers, careers advisers and professionals in FE and HE identify and appoint 32 'digital technology' STEM ambassadors to work across each Local Authority area in Scotland</td>
<td>Increased uptake of ICT/computing related subjects at school, FE and HE</td>
<td>Industry, FE/HE, Schools, Local Authorities, SDS, STEMhub</td>
<td>Autumn 2014</td>
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<td>Improving awareness of ICT and digital technology careers</td>
<td>Deliver a multi-channel, promotional and educational campaign to target key groups including young people, women, parents and new entrants from other sectors</td>
<td>Increased awareness of the career opportunities within the ICT/digital technologies sector across individuals and careers influencers</td>
<td>Local Authorities, SDS, ScotlandIS, SE, HIE, Industry, e-Skills UK</td>
<td>Summer 2014</td>
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<td>Addressing the gender imbalance in ICT and digital technology roles</td>
<td>Establish a Women Into IT Programme to raise awareness of the career opportunities and provide an introductory training programme and work experience</td>
<td>Increased numbers of women choosing ICT/digital technology subjects at school, FE and HE</td>
<td>SRC, SWIT, Industry, Schools, SDS, ScotlandIS</td>
<td>Autumn 2014</td>
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Previous
The action plan will be delivered under the guidance of the ICT and digital technologies skills group, who will also have a role in monitoring its success and impact.

The ICT and digital technologies skills action plan will develop a clear and transparent performance framework to monitor the progress of individual actions, as well as the overall performance of the SIP. Baseline data for the indicators of success will be collated and the overall success will be measured against:

- increasing the size of the ICT and digital technologies talent pool in Scotland
- increasing the proportion of women employed in the ICT and digital technologies sector
- increasing the number of appropriately skilled ICT and computer-related graduates
- increasing the numbers of young people who choose ICT and computing related subjects at school, further and higher education
- reducing the number of employers who cite unfilled vacancies and skills gaps in their workforce.

To support the implementation of the ICT and digital technologies skills action plan, funding has been secured through the Scottish Government’s Digital Scotland Business Excellence Partnership for 2014/15 and 2015/16. The Business Excellence Partnership Board will also have strategic oversight of the portfolio of work which will be delivered to ensure the effective deployment of these resources. It is proposed that an update on the progress and impact of the ICT and digital technologies skills action plan will be presented in one year’s time with a formal evaluation undertaken at two years.

"Skills will continue to play an integral role in the achievement of strategic objectives"
The SIP was developed by SDS with support from an external consultant who completed research and consultations under the guidance of the SIP Steering Group. This steering group comprised of colleagues from ScotlandIS, e-skills UK, Scottish Enterprise, Highlands & Islands Enterprise, SDS and the Technology Advisory Group (TAG).

A significant amount of research had already been conducted into the Scottish ICT and digital technologies sector and the SIP builds on the research and analysis already completed by public sector and industry partners.

A key element of the SIP development was the review and synthesis of these materials. In particular these included the e-skills UK “Technology Insights” and the ScotlandIS “Scottish Technology Industry Surveys”. A mapping of trends of uptake of ICT/Computing related provision in schools, HE and FE was also completed.

A fact finding visit to the Digital Skills Academy in Dublin was taken by SDS who completed research and consultations with key stakeholders and industry representatives to provide a wider industry perspective to the issues.

The following provides a definition of the terminology used in the SIP:
- ICT and digital technologies: the terminology used in the SIP when referring to ICT and digital technology professionals working within and outside of the sector.
- IT & telecoms: the name for the e-skills UK 2012 sector definition and which was agreed to be the best fit definition for the desk research element of the Skills Investment Plan.
- information technology (IT): The use of computers in industry, commerce and elsewhere, including aspects of systems architecture, human factors and project management.

When referring to education, there is an important distinction made between ICT and computing skills, as follows:
- ICT (information communication technology) skills - relates to pupils developing the skills to use modern digital technology – computers, smart phones, tablets and these are likely to involve using search, messaging, email, word processing, spreadsheet, presentation software, e-skills UK and some other organisations define this as digital literacy.
- computing/computer science - the academic discipline, encompassing programming languages, data structures and algorithms.

One of the issues for the ICT and digital technologies sector is that a number of definitions are used by different organisations. For example the terms 'IT', 'digital' and "computing" are often used interchangeably despite there being important differences. In particular there can be confusion in schools/education between ICT and computing.

Teaching provision
Over the four year period (2008-2012) the number of teachers with computing studies as their main subject area has decreased by 13.8% (106 teachers). It has been reported that some schools do not have any dedicated provision for teaching ICT/Computing.

Further education provision
A wide range of subjects such as Computing Science and Maths can lead to careers in ICT and digital technologies and consequently the SIP has identified that a key action is to better understand the supply, demand, retention and graduate destinations. Table 4 and 5 show the uptake of computing related courses at FE and only computer science courses at HE.

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<tr>
<th>Table 1: ITP Modern Apprenticeships (2008-Mar 2013)</th>
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<th>Table 2: Entries to Scottish computing qualifications (2007-2011)</th>
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<th>Table 3: Computer studies teachers (main subject) (2008-2012)</th>
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<th>Table 4: Further education students (2005/06-2010/11)</th>
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<th>Table 5: All students undertaking computer science courses Scotland</th>
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<tr>
<td>Change</td>
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<tr>
<td>% Change</td>
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Appendix 4 - Bibliography

- Higher Education Statistics Agency, 2011. Students and qualifiers at UK HE institution. Available at www.hesa.ac.uk/content/view/1897/239/
- Scottish Government, 2013. Scotland’s Digital Future - Supporting the Transition to a World-leading Digital Economy. Available at www.scotland.gov.uk/Publications/2013/05/2347
- SQW 2012. Review of the ICT Skills Plan
- e-skills UK
- Education Scotland
- Highlands & Islands Enterprise
- Scottish Colleges
- Scottish Enterprise
- Technology Advisory Group
- Scottish Funding Council
- SQA
- ScottishIS

Appendix 5 - Stakeholder consultations

A large number of stakeholders were consulted in the development of the Skills Investment Plan. This include:
- British Computing Society
- College Development Network
- Computing at Schools
- e-skills UK
- Education Scotland
- Highlands & Islands Enterprise
- Scottish Colleges
- Scottish Enterprise
- Technology Advisory Group
- Scottish Funding Council
- SQA
- ScottishIS
Acknowledgement

Skills Development Scotland would like to thank all the businesses and partner organisations who took the time to support the development of the SIP by taking part in workshops, focus groups and consultations. A specific thank you is also extended to the members of the ICT and Digital Skills Group who were integral to the development of the SIP.

March 2014