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MANIFESTO

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Manifesto

ScotlandIS have created our Manifesto to help inform government, industry and academic strategy and planning with insights gleaned through collaboration with our members and partners across Scotland's tech ecosystem. We consider our Manifesto to be a complimentary piece of work alongside all other activity taking place in Scotland ranging from Scotland's AI Strategy, the Climate Emergency Skills Action Plan and a number of other key documents. Our earlier Manifesto in 2016 led to the creation of the ScotlandIS Cyber and Data clusters, as well as an ongoing coordinated effort to bridge the Digital Inclusion gap In Scotland.

Digital as we know it has accelerated to the very forefront of our society in the last year.

The COVID-19 pandemic has demonstrated the urgency for Scotland's businesses and public services to accelerate their digital adoption. To do so, we need a dynamic tech sector to facilitate this by providing the digital solutions and services required to enable a thriving, inclusive, resilient nation. Scotland is already home to a vibrant tech ecosystem with over 1,500 companies that contributed £4.9bn Gross Value Added (GVA) to Scotland's economy in 2019, accounting for 3.5% of total GVA. GVA per head for the tech sector is 40% higher than for the economy, making it a considerable contributor to Scotland's economy. However, we cannot be complacent, we must remain competitive and innovative to compete with other countries across the globe who are utilising technologies at pace to enhance economic and social prosperity. Scotland is uniquely placed as a smaller Western economy to capitalise on some of our existing strengths and opportunities. As a nation we must ensure we invest in our people as we build towards a digitally inclusive and leading country.

In 2020, around 11,240 digital technologies businesses were registered in Scotland which makes up 6.3% of the Scottish business base. 97,000 people were in employment in the sector, making up 3.7% of Scotland's total employment. In the coming years, this figure is expected to continue to grow, which also presents several challenges to the sector when it comes to recruitment and attracting the right skills for Scotland.

This document offers a series of recommendations for stakeholders across Scotland to embrace digital transformation, to upskill our workforce and citizens. ScotlandIS have developed these recommendations through consultation with our members, clusters and partners across the tech ecosystem in Scotland. As we emerge from the COVID-19 pandemic, we have an opportunity to build back better, to reshape our society, to deliver highly skilled and fulfilling jobs and to drive efficiencies and productivity gains in our public services and established businesses.

Emerging Tech

Scotland's emerging tech scene has immense potential to become a pillar of our digital economy. ScotlandIS see Climate Tech, GovTech and Space Tech as being the three areas Scotland can capitalise on. The emerging tech ecosystem as we know it spans across the digital and tech sector as a whole and enjoys close relationships with each other. ScotlandIS have helped to foster an environment in the last 20 years which allows emerging tech and established tech to collaborate and innovate together as partners.

International evidence has demonstrated the value of establishing clusters to drive innovation and economic impact. ScotlandIS is a recognised cluster management organisation having attained ESCA's silver badge status. We believe that clusters have the ability to drive economic recovery and to support the wider tech ecosystem.

Climate Tech

Climate Tech is one of the fastest growing components of the emerging tech scene. Scotland is in a unique position as we build up to COP26 to capture the opportunities that Climate Tech can offer our economy, society and people. In November 2021, the eyes of the world will be on Glasgow, and Scotland should grasp the chance to demonstrate our strengths in Climate Tech to an International audience.

Climate Tech incorporates an array of technologies that operate across key sectors including electricity and energy, transport and mobility, agriculture, food systems, manufacturing and building technology. Underpinning these is the digital technology to help deliver solutions that will address and minimise the impact of climate change on our society. Climate Tech is becomingly increasingly important in all sectors of our economy. With global corporations, investors and governments pledging to transition to net zero they are all looking to new climate technology breakthroughs to be developed and scalable.

Space Tech

Scotland has a versatile and adaptable space sector. With one fifth of all UK jobs in the space sector based in Scotland, many of Scotland's space businesses are developing small satellites which support environmental data analysis and critical earth observation solutions. Our space sector now manufactures more satellites than anywhere else outside of the United States. Scottish Enterprise estimates that Scotland's space sector income could reach over £2 billion by 2030, as well as contributing data solutions to combat climate change.

Scotland's enterprise agencies have already demonstrated strong support to Scotland's space industry. These commitments build upon the Scottish Government's inward investment plan, launched in October 2020, pinpointing space as one of the selected FDI opportunities where Scotland's strengths meet global demand and will bring wider benefits to our economy.

Emerging Tech

GovTech

Scottish digital public services outperform the EU27+ average and the United Kingdom. Nevertheless, it stays behind the Nordic countries. Scotland's greatest gap is in the area of Key Enablers, as its eID and other building blocks are not yet at the same level of implementation as in Europe's best in class countries.

GovTech offers Scotland's public sector a chance to lead on our ambitions to become a digitally leading nation. In doing so, we can aim to follow a similar model adopted by Nordic nations. Nations such as Denmark, Estonia and Finland who have a strong emphasis on all things digital: submitting your tax returns, court proceedings, your medical records, setting up a business – even voting in elections. What's critical to note is there's nothing particularly revolutionary about their technology approach, and it is entirely replicable. Scotland needs to accelerate our national digital identity approach to enable us to capitalise on the many health, social and wealth benefits for citizens and government while ensuring ethical and security standards are maintained.

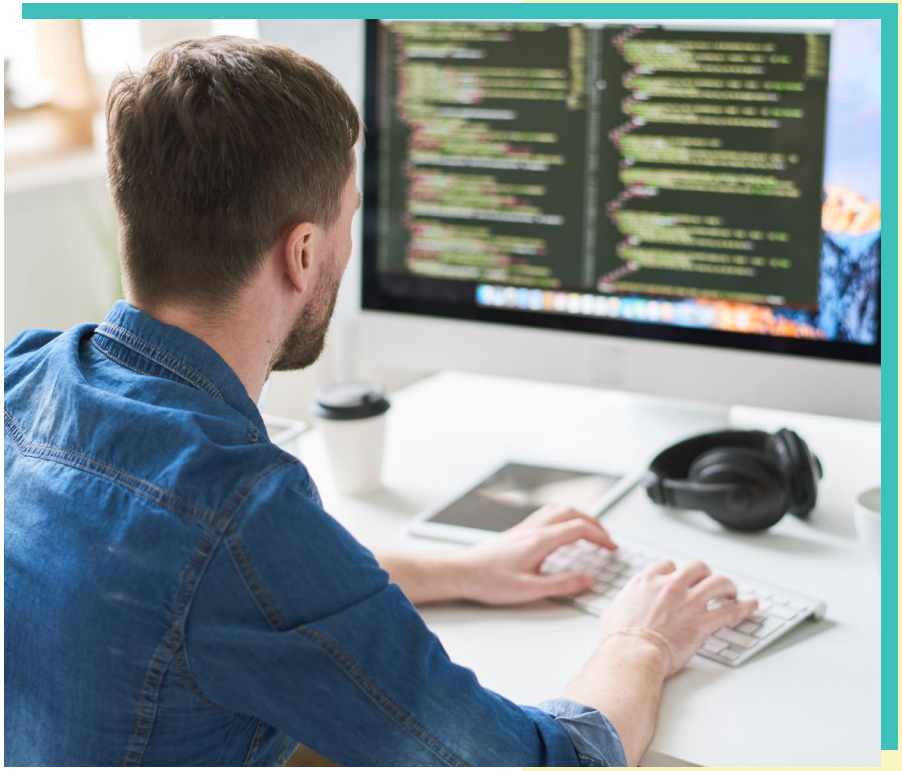
In the latest Scottish Government Digital Strategy, we were pleased to see a commitment to becoming an international player in the GovTech market. The COVID-19 pandemic has demonstrated the potential for GovTech to become more embedded in our tech ecosystem. Across industry we move quickly with the pace of technological change and government is also beginning to harness the potential it can offer. CivTech has demonstrated how innovation and closer collaboration between industry and Government can bring innovation to public services. However, we need to do more here to scale this for government and for Scotland's business community.

Recommendations

- A tailored funding/grant scheme should be set up by Scottish Government to enable organisations to invest in climate technologies to suit their business needs.
- Climate Tech, Space Tech and GovTech should all have dedicated cluster management programmes to help coordinate the activities of the sectors in the same way ScotlandIS Cyber and Data Clusters operate. This would enable these sectors to have better support mechanisms, a clear networking platform and an enhanced strategic focus.
- Scottish Government should invest in curating data intelligence services which can provide evidence-based solutions to our largest emission sectors. The ability to analyse and use climate-relevant Open Data sources would be a huge asset to our economy and forward planning.
- The Scottish Government should consider how it can direct its public sector spend on digital services and solutions that promote the industry in Scotland, while still ensuring overall taxpayer value.
- There must be a focus on growing existing clusters and establishing further clusters in key sectors in Scotland in order to support the economic recovery needed post COVID19 and to drive sectoral growth and innovation in these areas which benefits the Scottish economy as a whole.

Skills

Scotland has been impacted by the well documented skills shortage currently experienced across the UK, Europe and the US. Firms are struggling to recruit the staff needed to build and deliver their products and services and salary levels are rapidly increasing, disadvantaging smaller companies and particularly our SME (small to medium enterprise) Community. This situation is being made more acute by the growing demand for specialist digital skills from non-technology businesses as digital increasingly pervades all aspects of the economy.



The jobs of the future and the skills required will evolve at pace in the coming years. There is an expectation that there will be a rising demand in areas such as low carbon energy, data science, data analytics, artificial intelligence, including machine learning and robotics, material science, remote operations, and cyber security. In the last few years demand for cloud computing skills in particular has increased steadily according to our annual survey analysis, rising from 52% to 54% respondents.

ScotlandIS has worked with Skills Development Scotland (SDS) on the Skills Investment Plan and its outputs for several years, and the various opportunities available through the Digital Start Fund and will continue to do so. The creation of Digital Xtra Fund has enabled initiatives aimed at children and young people to be funded and capture their imagination at an early age, while CodeClan is retraining and upskilling many new people into the sector. In December 2020 ScotlandIS created our first Strategic Skills board aimed at tackling the country's digital skills gap and includes representatives from across private and public sector and educational institutions.

As a nation, we require increased collaboration from both business and government with a much stronger focus on promoting and delivering digital skills training across industry, academia, and schools. To bridge the gap between academia and Industry, we need to focus on placement programmes which equip students for the world of work. The digital skills partnership, run by ScotlandIS, has brought industry and academia closer together enabling industry to influence and support the teaching in Further and Higher education without having to overhaul the full system. Colleges are a key source of providing these shorter, sharper skills interventions to upskill and reskill individuals in data mining and data analytics.

Scotland must accelerate our progress towards a diverse and inclusive workforce to enhance our chronic productivity issues. This must be tackled at the outset in our schools. Just 20% of our school pupils studying computing science Level 5 are girls, and only 16% of students pursuing computing degrees at university are women. Current female participation in the tech sector sits at 23%, yet research suggests firms with higher levels of gender diversity are 15% more likely to outperform rivals. Over the years, Women in Tech has been one example where significant progress has been made in terms of improving the gender balance. However, diversity comes in many different forms. ScotlandIS consider it vital to focus on gender alongside the rest of these protected characteristics such as age, ethnicity, sexual orientation, disability and religious beliefs. To have a truly diverse and inclusive digital and tech workforce in Scotland, it is essential that we are representative of everybody in society. To this end, In July 2020, ScotlandIS set up our Diversity and Inclusion committee with representation from all aspects of the 2010 protected characteristics Equalities Act which we hope will drive awareness and change towards a truly diverse digital and tech workforce across all of Scotland.

Scotland's economy will only flourish if we are able to develop, attract and retain employees who are qualified and able to fulfil the jobs of the future. That future will be built around digital skills. We must invest now to ensure we grasp the opportunity or risk being left behind by competitors across the globe.

Recommendations

→ The SQA should introduce climate/carbon education across all levels of education in Scotland, including the role climate technologies can play in addressing climate change. Embedding this in the curriculum will allow students of all ages to be part of our educational journey towards net zero .

→ Skills Development Scotland should look to implement a lifelong learning programme here in Scotland. This model could be based on the SkillsFuture programme in Singapore. Every adult aged 25 or over in every job receives credits which they can use at their discretion to upskill/reskill depending on what jobs/ambitions they have. This could be critical to allow employees and citizens to upskill/reskill in growth areas such as climate tech, data analytics, vertical farming and offshore wind.

→ Scottish Funding Council and partners must continue to fund e placement programmes to allow our SME community the opportunity to attract talent.

→ There must be focus on those who are most at risk of being displaced from their jobs due to automation. Initial studies and work on this must begin now to ensure we prepare for the future of work.

Education

The Covid19 crisis has exposed challenges in education in Scotland from primary to tertiary. It has highlighted issues with equality of access, quality of learning materials and the disparity in infrastructure, approach, and delivery across the 32 local authority areas, 13 College regions and the Universities.

The world has changed, Scotland can lead this change if we capitalise on the potential of doing things differently and seize the potential to harness digital learning and the expertise within our education system.

Our schools grow our future Scots, they feed into colleges and universities and then, into the workforce. However, there is no systemic approach to Lifelong Learning post 25 years for those in work, seeking to re-join the labour market or upskill to meet the needs of the workplace. If we fail to transform our education system in line with the accelerated global changes, we fail the educators and the workforce of the future. Covid19 brings an accelerated need to fully understand the whole online learning environment.

We have the opportunity to create a National strategy, curriculum and platform to deliver equality of access and learning across the whole of Scotland. Education can be the great equaliser if all have the opportunity to access appropriate provision.

We recognise that we have dedicated professionals in education in Scotland, determined to deliver the highest quality learning possible. We recognise their expertise and effort, we also recognise that without the right supporting infrastructure and overarching strategy, their jobs are made so much more difficult.

Education should be addictive. Children and young people learn differently to preceding generations, they are immersed in technology. We can harness this to drive change. We need to learn from best practice around the globe and at the same time engage directly with current and future employers to determine what is needed.

Recently teacher training commenced the inclusion of a focus on the science of knowledge transfer and retention, the psychology of learning and the need to make learning as addictive as gaming currently is, there is a real opportunity to engage with teachers and harness this new expertise.

We need to do things differently and not replicate the as-is, not simply take classrooms online.

A permanent shift is possible, a blend of virtual and physical education can deliver more effectively be tailored to the needs of learners, can open international paths to learning and empower the students. Change is inevitable, the Covid19 crisis has created an unprecedented need to accelerate this.

Digital education as we know it must radically transform to keep up with the pace of technological change. ScotlandIS have been running our Critical Friends programme since 2018, originally for college and university lecturers under our Digital Skills Partnership – https://digitalskillspartnership.scot/critical-friends/

ScotlandIS are running an initiative for DYW Glasgow, connecting schools and computing teachers to digital technology practitioners/companies to meet the rapidly growing and changing skills requirements of the digital industry. The Critical Friends Programme matches teachers with individuals from industry for 12 months to strengthen the relationship on both sides, share current industry practices, advise teachers of where the new technologies are and help them become advocates for them.

Recommendations

→ A National Digital Strategy for Education which covers all sectors, underpinning a National Economic Strategy.

→ A digital hub should be created in every school/community.

→ The critical friends programme should be funded to enable it to be rolled out nationwide. This would allow all schools across Scotland to benefit.

→ All computing science teachers across Scotland should have an “industry support network” to enable them to share best practices and ideas with peers and industry leaders.

→ The SQA should form an industry leadership group to allow expert views from the digital and tech sector to enable a flexible and evolving curriculum fit for purpose.

Immigration/ Migration

We are aware immigration policy is a reserved matter for the UK Government, but the issue is a critical one for the Scottish digital and tech sector, nonetheless.

There are skills gaps and labour shortages across a range of sectors in the Scottish economy, but the skills gap in the digital and tech sector is growing exponentially. An inability to source the right people with the right skills will negatively impact the Scottish digital and tech sector and its ability to grow. We must also recognise that Scotland is now competing with the rest of the globe when it comes to our talent, particularly with remote work growing in momentum. This can of course be an opportunity for Scotland too if we can continue to improve our digital and tech eco-system to attract talent from elsewhere too, and ensure we engage with Home Office to facilitate a visa / immigration system that works for the Scottish digital and tech sector.

All of Scotland's future population growth is projected to come from inward migration, according to the National Records of Scotland. ScotlandIS are passionate about regional economic growth and we will work with those tech companies in rural regions who are already facing challenges in recruiting with the end of free movement

Recommendations

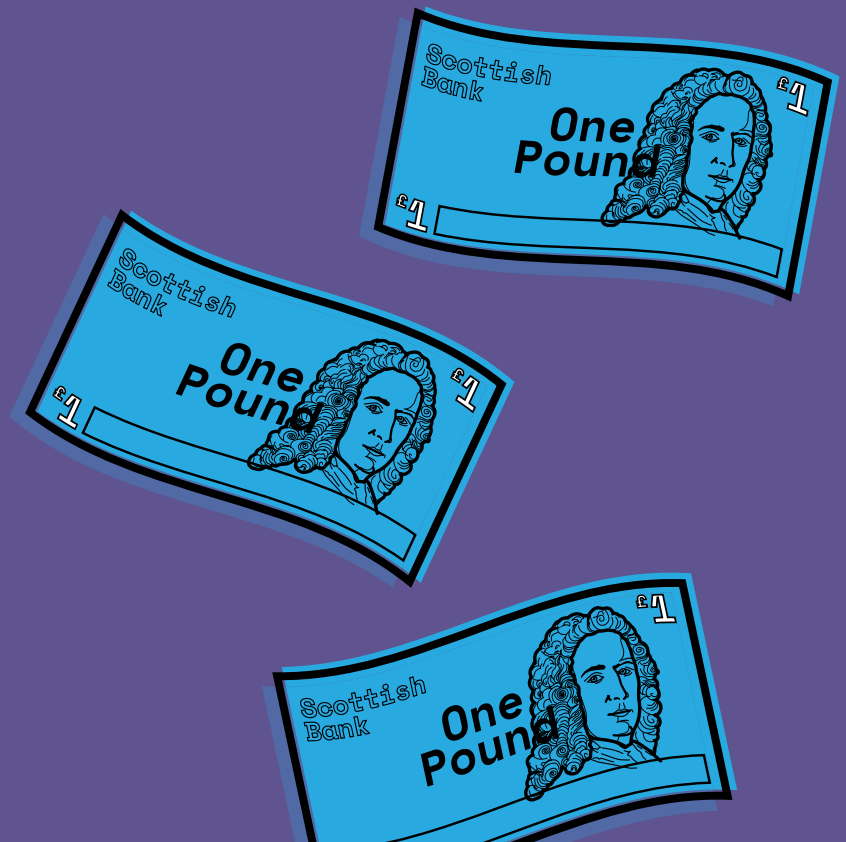
→ Scotland must focus on upskilling and reskilling our existing workforce to ensure we keep up with the pace of technological change. We must embark on this journey as a nation and ensure no one is left behind.

→ The Scottish Government must continue to work closely with the UK Government and Home Office to discuss how future policy proposals such as tech visas could be implemented in Scotland earlier as a pilot programme.

→ Talent Scotland should work with trade bodies across the digital and tech sector to embark on a campaign that promotes Scotland as place of "work, rest and play" for our existing migrant talent to remain in Scotland and be part of our digitally inclusive nation.

Investment

Scotland must diversify our investment framework to ensure our digital and tech sector remains competitive and sustainable. Covid-19 has demonstrated that government stimulus can take place on a large scale and moving forward, investment must be channelled into digital skills, digital infrastructure, innovation, and programs that will build our economic resilience.



In the UK as a whole, tech start-ups in 2020 raised a staggering €1.4bn. Venture Capital investment has remained resilient in Scotland over the last year and remains a key lever for the sector to utilise. Analysis from KPMG highlights that 22 VC deals were completed between April and June, which was an increase of four from the first three months of 2020. These deals equated to a combined value of at least £62 million, up from £32 million. 13 of the 22 deals were completed in Edinburgh, followed by Glasgow with two deals. Although this is pleasing, it is crucial that place-based investment is at the heart of all governmental investment strategies to ensure we have sustainable economic growth in all regions of Scotland.

Scotland also has historically had a well-supported and vibrant investor market for seed and early-stage SMEs up to the c£2m investment level with a combination of Scottish Enterprise and angel-investors providing strong support to this sector. The challenge after this funding was where companies looking to commercialise their ideas and products went for the next stage of significant investment.

The newly established Scottish National Investment Bank has enormous potential in this space to act as the lever between the public and private sector. As the Bank's primary mission is to support the transition to net zero, with another of its missions focussed on harnessing innovation, there is the clear potential for shared interest between the Bank's agenda and the development of Emerging Tech. The Bank will seek to invest debt and equity on commercial terms based on the needs of individual projects or businesses and will typically invest in businesses and projects seeking more than £1m in investment support, therefore investment towards technology is paramount.

Recommendations

→ Scotland must aim to attract more global multinational companies to help grow and sustain the sector and its supply chain.

→ The Scottish National Investment Bank should form a strategic partnership with ScotlandIS in order to enable the continued growth of the digital and tech sector. ScotlandIS is ideally placed to facilitate engagement with the tech sector in Scotland and could support the Bank and the industry through investment focused workshops, peer to peer learning and ongoing market intelligence work on emerging tech.

→ The Scottish Government must focus on fostering a fertile environment for indigenous tech companies to remain and flourish within Scotland. Mechanisms to do so could take place in the form of tax incentives.

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