Smart Citizens, Smart City Regions

Delivering Digital Public Services in Scotland

scdi Scottish Council for Development and Industry

Engaging Civic Scotland: Driving Economic Growth

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Overview

The purpose of this report is to make recommendations on the transformation of public services in Scotland, how it can be achieved and what support could be put in place to help the transition. SCDI, ScotlandIS, The Royal Society of Edinburgh and BT Scotland believe that the successful delivery of digital public services will spread economic benefit and growth as well as enhancing the experience and engagement of citizens in Scotland. The report and recommendations are designed to constructively add to the forthcoming Scottish Government digital strategy refresh and to help create a vision and roadmap to take Scotland towards the world-class digital nation aspired to by The Scottish Government and others.

The recommendations have been developed by a steering group, drawing on the discussions held at a Digital Forum - *'Smart Citizens, Smart City Regions'* - held in Autumn 2016 in Glasgow, as well as referencing previous work carried out by the group published in 2016 on digital technology and productivity[1]. *(See Appendix 1.)*

This Digital Forum brought together the public and private sectors with input from experts to help define the benefits and challenges Scotland could see as a result of digital public service transformation.

A number of key themes developed during the discussions:

- The need for strong leadership at the highest level in Scotland to make digital transformation a success;
- The need for the pace of digital public service rollout to accelerate;
- A clear focus on developing and/or importing digital skills to meet the growing skills gap;
- Consideration to be given as to how to keep Scotland's schools and educational institutions up to speed with such a rapidly developing technology sector.

Key Recommendations

Leadership

- The Scottish Government should appoint a high profile Digital Leader for Scotland to lead Scotland's digital transformation: to drive public and private data sharing; devise and project a compelling vision for Digital Scotland; progress action towards this vision; and contribute to economic growth through enhanced productivity of public services.
- The Scottish Government, working with local authorities, should devise a set of metrics that allow for annual benchmarking of performance against the Digital Scotland vision. An annual Ministerial announcement of progress would demonstrate leadership commitment.
- The Scottish public sector must build a relationship of trust with citizens that will underpin faster rollout of digital public services and put citizens in control of their digital lives. The development of a trusted 'data bank' mechanism that covers data collection, sharing and storage of personal data of citizens will require top-level leadership.

Pace of Change

- An audit of local authority functions and public services such as health and policing should be conducted by the service leaders, the local authority CDO (Chief Digital Officer) and Scotland's Digital Leader to assess the impact of digital transformation on employment and to identify and prioritise the services that can be digitalised most easily and/or that will result in greatest impact.
- Public service providers must acknowledge that some people will simply never be able to manage their lives in a digital way, so there is a need to create a central complex needs or extra help unit that works across all services to support non-digital service users.
- To drive the behavioural changes required to make digital public services the channel of choice among users, the Scottish Government should create a programme of citizen digital champions: people who regularly use public services to support their needs and with whom other users can identify. These champions can tell the story of their experience and provide reassurance to those about to start their own journey.

Digital Skills within the Public Sector

- The Scottish Government, working with local authorities and other public bodies, should establish a digital workforce development programme (similar to the Digital Champions model for top-level officials) that actively supports public sector staff at all levels to invest in their own digital understanding and skills, and apply these to the workplace.
- The creation of a 'Public Sector Digital MBA' would create a pool of talent operating across both technology design and user needs analysis. This should be a flexible programme where individuals would undertake secondments across multiple organisations to progress and advise them on their own digital journeys.

Education

- The Scottish Government must provide high-level leadership to demonstrate the priority that should be given to embedding digital skills across the school curriculum, and to computing science as a core science. It should work closely with education and industry stakeholders to support and build on current successful initiatives and to further develop close partnership between the private and education sectors.

Background

In January 2016, SCDI, ScotlandIS, The Royal Society of Edinburgh and BT Scotland published *'Digital Solutions to the Productivity Puzzle'* - a report with recommendations on how the successful utilisation of digital technologies could support the priority of improving productivity. A number of practical recommendations were made, designed to help drive the productivity agenda through digital, most notably the call for the appointment of a Chief Digital Officer (CDO) for Scotland. The appointment of a CDO for local government was made later in 2016, but a national CDO post was not created.

The same partnership group came together to analyse research and to consider recommendations on the application of digital technologies to public sector service provision. The background for this new piece of work is the appointment of the local government CDO, the scale of the challenges faced by public sector finances through demographic changes, as well as deficit reduction and the prominence of the public sector in the Scottish economy. 20.7% of employment is provided by the public sector in Scotland[2] and public spending amounts to £68.6 billion per annum.[3] The recommendation to appoint a CDO was a response to concerns around pressure on public spending and long term demographic trends. For example, between 2010 and 2035 it is estimated that the number of people over 75 years of age will increase by 82%.

This rising demand and budgetary pressure creates a picture of an unaffordable future. Creative use of technology will create efficiencies to reduce pressure on spending and deliver better outcomes for citizens and businesses.

The previous report focused on productivity, largely in the private sector. Productivity improvements are also part of the solution to the public sector funding issue. The public sector has not experienced the same improvements in productivity as the private sector in the UK, which itself is still lagging other international comparators. Increasing public sector productivity through the rollout of digital public services could be an essential element of future economic growth in Scotland. Digital transformation could also support public sector employees to diversify their skillsets, enjoy more creative roles and deliver better frontline services. This could be facilitated through standardising and possibly automating transactional processes to free up resource.

Christie Commission on the Future Delivery of Public Services

In 2011, the Christie Commission recommended that The Scottish Government implement a series of reforms to public services in order to manage the impending challenge of reduced budgets and rising demand. The Commission proposed radical changes to the delivery of public services in order to avoid a potential £3bn funding gap by 2016. In the immediate years after the report, The Scottish Government responded by highlighting the priorities for reform in its 2011 strategy *Renewing Scotland's Public Services*[4], which included the creation of single Police and Fire services with a focus on digital to drive down operational costs.

The *McClelland Review of ICT Infrastructure in the Public Sector in Scotland* was also published in 2011 and made recommendations to improve Public Sector ICT infrastructure, using digital to potentially save up to £870m.[5] The Scottish Government National Public Service Strategy and Action Plan[6], published in 2012, aimed to implement McClelland's recommendations. Local authorities remain committed to reforming public services and improving digital services. Through COSLA, the *Local Government ICT Strategy* was developed and agreed in 2013,

leading in 2016 to the appointment of Chief Digital and Chief Technology Officers to drive digital innovation. Most recently, in 2015, the Scottish Government delivered its latest response to the Christie Commission's recommendations through the *Community Empowerment Bill*. Over five years on, and despite the significant response by both local and national government, the recommendations presented by the Christie Commission remain imperative with public services still facing significant cuts, debt and increase in demand.[7]

The Christie Commission recommendations focused on four pillars: outcomes, prevention, integration and engagement. The challenges facing public services remain similar to those identified by the Commission; arguably these challenges have grown in severity since the publishing of the report. The austerity policies that were a consequence of the recession have continued longer than expected due to slow economic recovery and have significantly reduced public service funding. Whilst funding continues to be cut, demographic changes and economic uncertainty continue to increase the demand for public services.

Scotland continues to face entrenched inequality and challenges and the decision to leave the EU has increased economic uncertainty, with the UK economy facing challenging years. A decline in projected growth and decreases in immigration will place Scotland's public services under increasing pressure. It is recognised in the Programme for Government that the Scottish Government aims to progress and improve public service delivery. But challenges to public services are expected to grow and there must be a focus to make continued progress on Christie's recommendations to develop digital innovation to drive efficiency in the delivery of public services.

Introduction

Scotland is on a digital journey. Due to the unique nature of Scotland's geography and the pace of change of technology it was always going to be a difficult road to travel. The UK and Scottish Governments, along with significant financial support from Scotland's local authorities and private sector investment from BT, have invested £410 million[8] in the Digital Scotland Superfast Broadband (DSSB) programme which will ensure that 95% of premises have access to high-speed broadband infrastructure by the end of March 2018. Speeds vary across the country; however, more than two million Scottish homes and businesses can now order fibre broadband as a result of BT's multi million pound commercial investments and the Digital Scotland project.

The Scottish Government has made a commitment to deliver 100% superfast broadband (>30Mbps) to all premises by 2021, as set out in the Programme for Government published in September 2016. In a country where the majority of the landmass - some 95% of Scotland - is defined as rural, digital communications technology and high speed broadband delivers the ability to overcome distance and creates efficiencies of time that offer the possibility to completely alter the economic potential of the country.

It was recognised at an early stage that the physical infrastructure alone would not be enough to transform Scotland into the digital nation it aspires to be. Digital skills are also critical in enabling the population to make the most of the infrastructure investments: to help drive economic growth through digital transactions and through the development of new business opportunities, utilising the technology networks now available in Scotland.

The Scottish Government has signalled that it will prioritise inclusive growth as part of the overall economic strategy for Scotland. The regional disparities within Scotland are stark across a number of measures but better health, education and economic outcomes are critical to closing inequality gaps. Digital transformation has a role to play in all areas to support the inclusive growth and inclusion agenda. It can help deliver low cost access to services by creating platforms that reduce or eliminate transport costs. The reduced costs of virtual meetings, rather than the use of expensive face to face resources, allow reallocation of budget to target areas of greater need.

The biggest risk, however, is that of a widening inequality divide brought about by not adopting these lower cost, better targeted options at the same pace as budgets are reduced in the public sector. Launching services that can be used by the majority of people, who do have access and the skills to use them, will free up resources to support others who need it; and help to deliver the transformation programme universally.

Given the pace and scale of infrastructure investment in recent years, Scotland now has most of the tools required to utilise the investment made in technology. However, the transformation of Scotland into a nation that thinks and acts digitally has not kept pace with the rollout and take-up of technology. It also doesn't reflect the number of citizens who have acquired basic digital skills and make use of technology in their daily lives. Scotland now needs to move ahead on its journey, which has seen it move through an infrastructure rollout phase to an access phase and now on to the new phase of adopting truly digital behaviours.

A shift needs to be made from acquiring skills to changing behaviours which is key to getting the most out of the networks we now have in place and generating the efficiencies of time and cost that are required in the current public spending context. Skills allow people to access the technology and get it to do what they want. Developing digital behaviours is a much deeper process which sees us transforming how we perform transactions, re-designing existing services or creating new services.
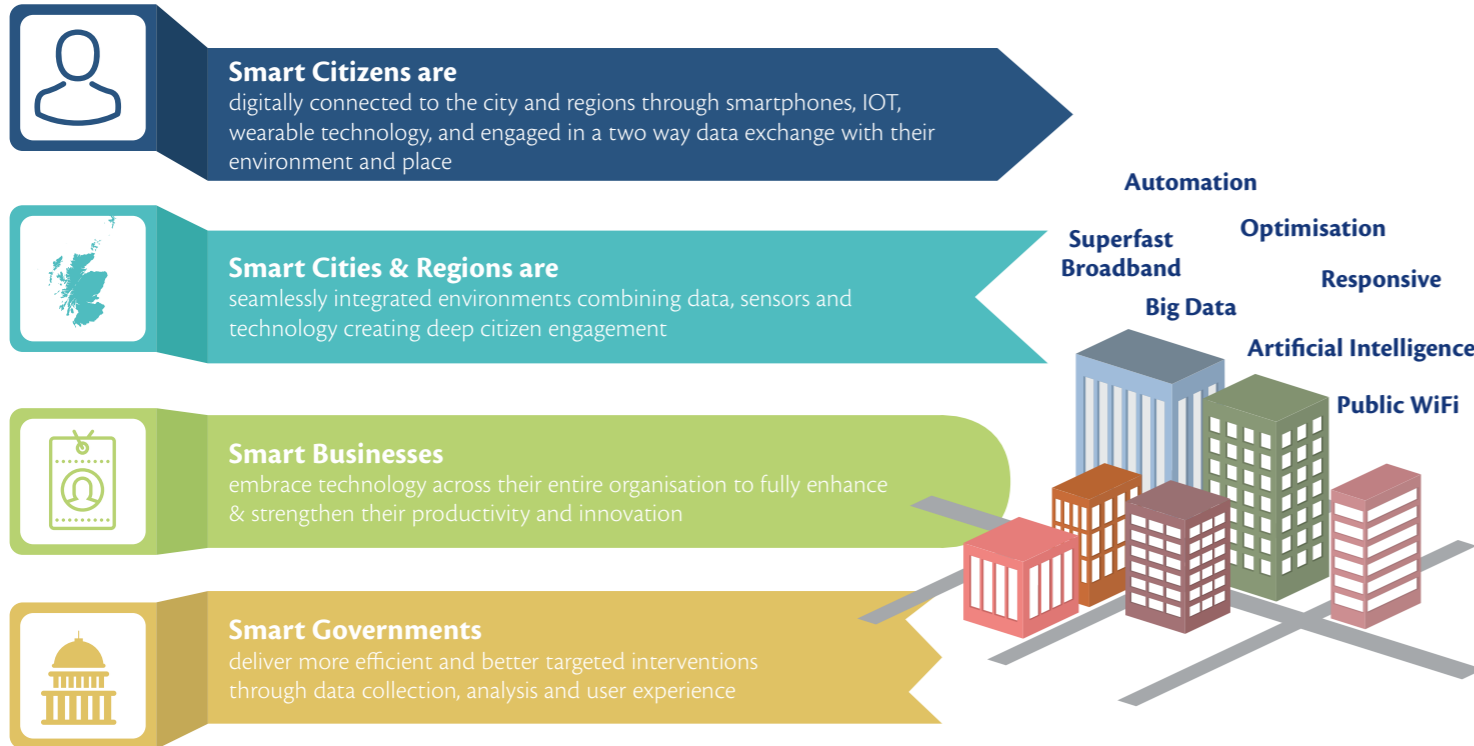
Digital transformation of retail shopping, holiday booking, entertainment and banking has already put us more in control of our commercial transactions while delivering cost savings and better outcomes: they are easier and more fit for purpose now than they have ever been. This report seeks to offer recommendations to help move the digital transformation of Scotland's public services forward; to help increase the pace to allow us to make full use of the infrastructure asset that has been created; and to support the drive for Scotland to take a leading role in making the transition to a digitally enabled, smart nation.

2. http://www.gov.scot/Topics/Statistics/Browse/Labour-Market/TrendPublicSectorEmp
3. http://www.gov.scot/Publications/2016/08/2132
4. http://www.gov.scot/Publications/2011/09/21104740/0
5. http://www.gov.scot/Publications/2011/06/15104329/0
6. http://www.gov.scot/Publications/2012/09/6272
7. http://www.audit-scotland.gov.uk/docs/local/2015/nr_150305_local_government_overview.pdf
8. http://www.scottishfuturestrust.org.uk/files/publications/Taking_the_Connected_Highway.pdf

Digital Scotland - Benefits to Citizens and Businesses

Smart Citizens are digitally connected to the city and regions through smartphones, IOT, wearable technology, and engaged in a two way data exchange with their environment and place

Smart Cities & Regions are seamlessly integrated environments combining data, sensors and technology creating deep citizen engagement

Smart Businesses embrace technology across their entire organisation to fully enhance & strengthen their productivity and innovation

Smart Governments deliver more efficient and better targeted interventions through data collection, analysis and user experience

Automation

Optimisation

Superfast Broadband

Responsive

Big Data

Artificial Intelligence

Public WiFi

In any nation, interactions with the state will be a prominent feature of citizens' lives. Applying the thinking, and therefore the efficiency gains, of the digital economy to the transactions between citizens and the public sector will transform the experience of citizens; deliver more efficient and better targeted interventions; and could place Scotland at the forefront of innovative thinking that is required across the globe to combat the demographic changes set to impact all societies. Getting the transformation of public services right will create benefits locally, regionally, nationally and globally.

The benefits that can be gained will not come at zero cost. Some of this cost will be financial; some will be the hard choices that will need to be made about the structure and delivery of services in different ways.

Organisational change is necessary to support digital transformation and there will be headcount loss as some processes and services are automated. These costs can be assessed and mitigating steps taken as part of the planning cycle.

Service re-design offers an opportunity to re-think the allocation of frontline resources to offer better quality experiences for users and better work quality for employees. Public sector leaders will need to be up to the challenge, and must be prepared to be challenged by the proposed Digital Leader as well as citizens, as public service delivery becomes fit for a new era. Creating a completely new service that starts from user needs will allow for the genuine integration of preventative measures to reduce spending later in the service pipeline. For example, the ability to use digital monitoring of health

data on an ongoing basis to make a direct impact in reducing hospital admissions will reduce overall costs in the system.

Citizens will form part of the user journey and will have greater oversight than ever before over the systems and processes that govern their lives at local and national levels. Using user journey mapping on digital platforms, decisions will be supported with better information. Being able to properly envision the available choices, such as choosing social care packages versus residential care, will provide a greater sense of control at difficult times for people. These types of major decision points only occur a very small number of times in a person's life; it is currently very difficult to prepare or have full sight of the knowledge and facts for such an irregular occurrence.

User Focused Technology

The Scottish Government conducts research into user journeys to enable participatory service design. This recognises that the citizen usually needs the state or government if something has gone wrong or if they need to perform a transaction. The simpler the service design, the more likely it is that the citizen will use digital channels. The aim of the programme is to understand the lives of citizens and create insights to help design better services. The team uses informal gatherings, life event mapping and user research to ensure that the new era of public service delivery transforms processes and doesn't simply digitise the old model with its current flaws. The benefits of this approach are more efficient, usable services, where the well understood parts of a user journey can be automated with staff focused on the complex or unusual cases.

The Smart Citizen

What does it mean to be a Smart Citizen?

To get better service from our eBay contacts or to interact with the sorts of people we

want to engage with online, we build profiles, create identities, rate our experience and provide feedback to help them improve. Many of us are happy to share our life events, give approval or disapproval on issues and our opinions on digital platforms like Facebook and Twitter. This same relationship is not afforded to the entities that actually govern society; a trust barrier exists between citizens and state when it comes to data.
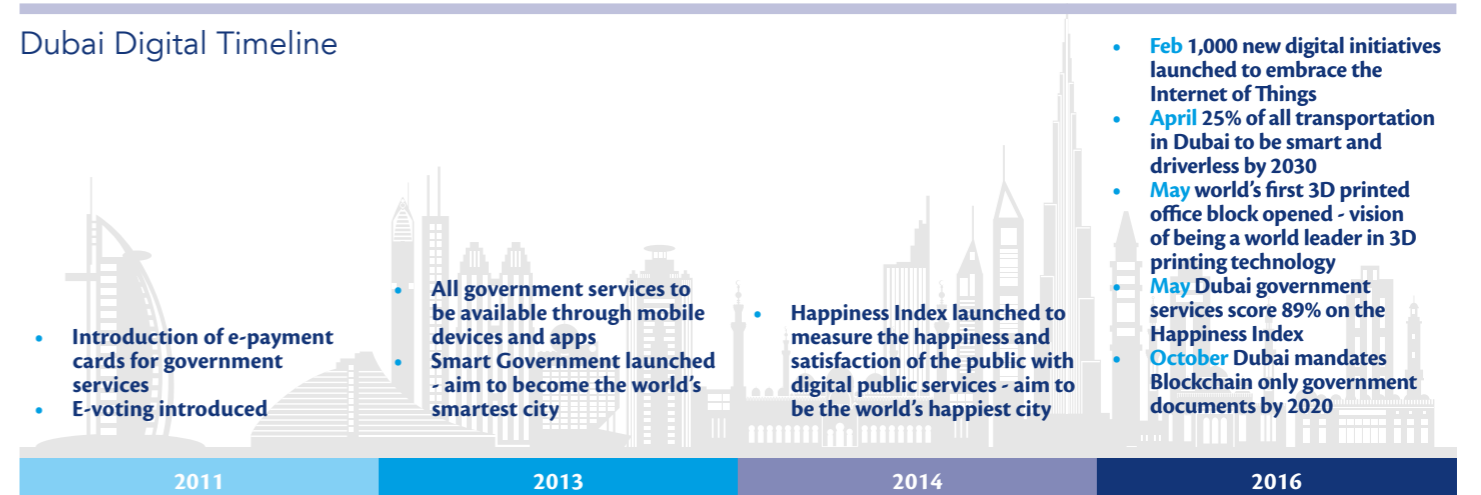
Nor has government made best use of the data it has. Citizens' interactions with government can be irregular but are often predictable. Government knows when children are born and most take a fairly well defined path through life. Key milestones like the process of registering for nursery and then school can be predicted in terms of timeline from birth but the process is not as seamless as it could be, given these are a simple set of transactions based around the age and geographic location of a child. Likewise, tax is calculated once a year, a passport is renewed every ten years, and benefits are claimed when circumstances change. The smart citizen can only be a product of a two-way interaction between a state or government and its people.

Data from Ofcom says that 82% of internet users buy and transact online[9] and the frequency of this is increasing. While use of digital public services is increasing over time, only two thirds of those with access to the internet have used it to complete a transaction with government online. The reasons for this difference need to be understood in order to close that gap.

One of the key areas where technology can make a real difference to citizens is in health. In November 2016, it was announced that a new eHealth strategy for Scotland would be developed integrating digital health and social care and looking forwards to 2022. There are a number of strong case studies from eHealth programmes that demonstrate the additional value and enhanced citizen experience gained through the application of technology.

At the Digital Forum, Dr Jim Hamill of Future Digital Leaders outlined the approach taken in Dubai - one of the world's leading digital nations. The graphic below documents the timeline and what citizens of Dubai experience as the reality of living in a digital nation.

Dubai Digital Timeline

- Introduction of e-payment cards for government services
- E-voting introduced

- All government services to be available through mobile devices and apps
- Smart Government launched - aim to become the world's smartest city

- Happiness Index launched to measure the happiness and satisfaction of the public with digital public services - aim to be the world's happiest city

- **Feb** 1,000 new digital initiatives launched to embrace the Internet of Things
- **April** 25% of all transportation in Dubai to be smart and driverless by 2030
- **May** world's first 3D printed office block opened - vision of being a world leader in 3D printing technology
- **May** Dubai government services score 89% on the Happiness Index
- **October** Dubai mandates Blockchain only government documents by 2020

2011 **2013** **2014** **2016**

9. https://www.ofcom.org.uk/__data/assets/pdf_file/0028/76177/section-5-media-activities.pdf

Case Study

My Diabetes My Way

In the UK, it is estimated that diabetes spending will consume around 17% of the entire NHS budget over the next 10 years. Low-cost population-based solutions are therefore desperately required. Effective patient self-management driven by education, empowerment and motivation is the key to positive health outcomes.

My Diabetes My Way (MDMW) is the NHS Scotland interactive website for people with diabetes and their carers. It contains multimedia resources aimed at improving self-management, including traditional information leaflets, interactive educational tools, videos describing diabetes-related complications and testimonials from people with diabetes talking about their experiences.

MDMW also offers users access to their clinical data via its novel electronic personal health record (ePHR). The ePHR sources data from primary care, secondary care, specialist screening services and laboratory systems; including diagnostic information, demographics, process outcomes, screening results, medication and correspondence. These data provide a more complete overview of diabetes than is available from any single data source.

Patients can use MDMW to share information with their healthcare teams, through automatic data upload, secure messaging and online discussion forums, further enhancing communication. They can also set and record their own realistic goals and receive highly-tailored advice and guidance based on the current status of their results. For example,

using the latest foot risk assessment, the system provides links to leaflets and videos relevant to their condition. Over 12,000 patients across Scotland have logged in and user evaluation shows that they find it a useful tool to aid self-management by improving knowledge and motivation to make positive changes.

A recent survey of active users provided the following key results about the service:

- **92.1%** contained all expected features
- **89.1%** system was easy to use
- **87%** reminded users of information discussed at consultations
- **94.2%** supporting information helped understanding of results
- **95.9%** helped monitor changes over time
- **88.2%** helped manage diabetes better
- **89.3%** improved motivation
- **96.7%** confident the system was secure
- **96.4%** system will significantly improve diabetes self-care in Scotland

In September 2016, data for the patient cohort were analysed to assess the impact on users' clinical outcomes. A pre/post analysis was performed to compare clinical measurements prior to records access and one year after first login. The standout point in this analysis is the statistically highly significant improvement of 2.57 mmol/mol in HbA1c ($p < 0.001$) amongst active users. Further statistically significant improvements are also shown in total cholesterol ($p<0.001$), HDL cholesterol ($p<0.001$), diastolic blood pressure ($p<0.001$) and weight ($p<0.001$). Further analysis is underway to determine associated cost savings.

MDMW is not dependent on the clinical information infrastructure used within NHS Scotland and has been designed in such a way that it can be adapted to link with appropriate clinical records in other environments. If a suitable data source is available, such as an existing diabetes clinic system or GP diabetes record, any organisation would be able to integrate with MDMW, giving their patients the ability to make use of the functionality developed. The framework developed also has the potential to be extended to cover other disease areas. This service is genuinely unique worldwide, providing records access to an entire national population.

The Smart City Region

We know that a smart city or place has the potential to deliver a better quality of life.

Fiona Young of PwC highlighted five key assets at the November 2016 Digital Forum:

- sustainable economic development
- organic growth
- use of technology as an enabler
- connected everything - delivering an efficient and seamless experience, as well as;
- intelligent infrastructure that brings together people, business and creativity.

Life can be made easier, healthier and safer as technology driven by real time data will 'see' who you are, where you are going and will probably already know your route. You can be informed of the quickest way, or possibly the healthiest way, to get there by monitoring traffic flows in the external environment from cameras and sensors. By checking the number of steps, route data can be integrated into a personalised package that helps you achieve multiple goals – not just getting from A to B but doing it in a way that will help reduce your asthma by avoiding more heavily polluted areas and help achieve your fitness goals by recommending a route to increase your daily step count.

As people start to live their lives in this way, city and place planning will have to respond by creating places that facilitate the smart lifestyle, such as making new walking routes based on where people actually want to go. Places will be able to market themselves on their spatial

response to what the people who inhabit them want - the walking city, the cycling place or the greenspace town. People and their data will become part of the creative placemaking process, without having to respond to a public consultation or speak to their local authority; they will do it simply by living their lives.

The Scottish Cities Alliance has provided a set of smart cities characteristics which are useful in thinking about smart cities or places.

Citizens & Communities
Citizens across different communities should feel engaged and empowered to live a fulfilling life. This should be achieved by providing access to information, realising needs and bringing together the right resources to meet specific challenges.

Business & Economy
Scotland will be recognised as a healthy, innovative and resourceful place to live and work. By working together to establish an expansive programme to achieve mutual goals. Scotland's cities will attract new funding and become more attractive to Foreign Direct Investment.

Environment
Scottish cities will become smart and sustainable economies powered by renewable energy and using data and technology to drive transformation.

Performance & Operation of Cities
A strategic, evidence-based approach to city performance and operations that uses data

and information from public and private sources, achieves the buy-in of all city stakeholders, attracts informed and focused low carbon investment, and improves the quality of life for all.

The Smart Business

Internet-driven transactions have seen businesses radically transform. The way people consume news, choose restaurants, buy clothing and also, more and more often, sell is almost unrecognisable from the norms of ten years ago. Adaptability, by both businesses and citizens, has been critical: the playing out of the well-known expression 'creative destruction' has been evident to all. Some businesses have managed to re-invent themselves, taking advantage of digital technologies, understanding their transactional relationships, and adjusting their delivery model and products, such that they have thrived in the new economy.

Digital public service transformation can support smart business and smart businesses by helping to support citizens on their digital journey, broadening their skills base and opening up new opportunities for them. The following two Case Studies offer insight into the digital transformation process undertaken in the business context for two organisations who have key stakeholders that, through their own research or that of other bodies, have been identified as less likely to use digital technology for communications and interaction.

Case Study

Remploy

Innovating with a Unique Digital Service

Remploy seeks to improve the lives of disabled people and those with complex needs through the power of work. In 2015, 70 years after it was formed, Remploy left government ownership in a joint venture between MAXIMUS, an international company providing health and employment services on three continents, and Remploy's employees, who have a 30% stake in the new business.

Innovation is the key to delivering a digital service which can reach and provide employment support to disabled people. After older people, disabled people are the second largest group of individuals likely to be digitally excluded.

Remploy, the largest provider of employment services to disabled people in Scotland, has developed a unique online service which gives individuals the choice and control of how, where and when they want to engage and receive support.

More than 16,000 disabled people (1,500 in Scotland) have accessed the Remploy Online service. The service is supported 7 days a week by online advisors who provide advice and support and enable disabled people to access online job-searching and development sessions as well as forums and blogs.

In a new 'blended' approach to digital support, disabled jobseekers can be paired with an advisor who they can meet face-to-face in a branch and with an online advisor who can support them remotely, either over the telephone or via online video conferencing.

This gives the disabled jobseeker the choice and flexibility to receive employment support when and where it suits them best - whether at a branch, at home or on the go. The online and 'bricks and mortar' advisors support the customer in unison, providing a truly blended model of employment support.

The digital offering is especially useful for people living in rural communities, allowing them to receive employment support without having to travel long distances to their nearest Remploy branch. Similarly, our data suggests that digital support is especially valuable to people with mental health conditions, reducing the anxiety that can be created when relying only on face-to-face support.
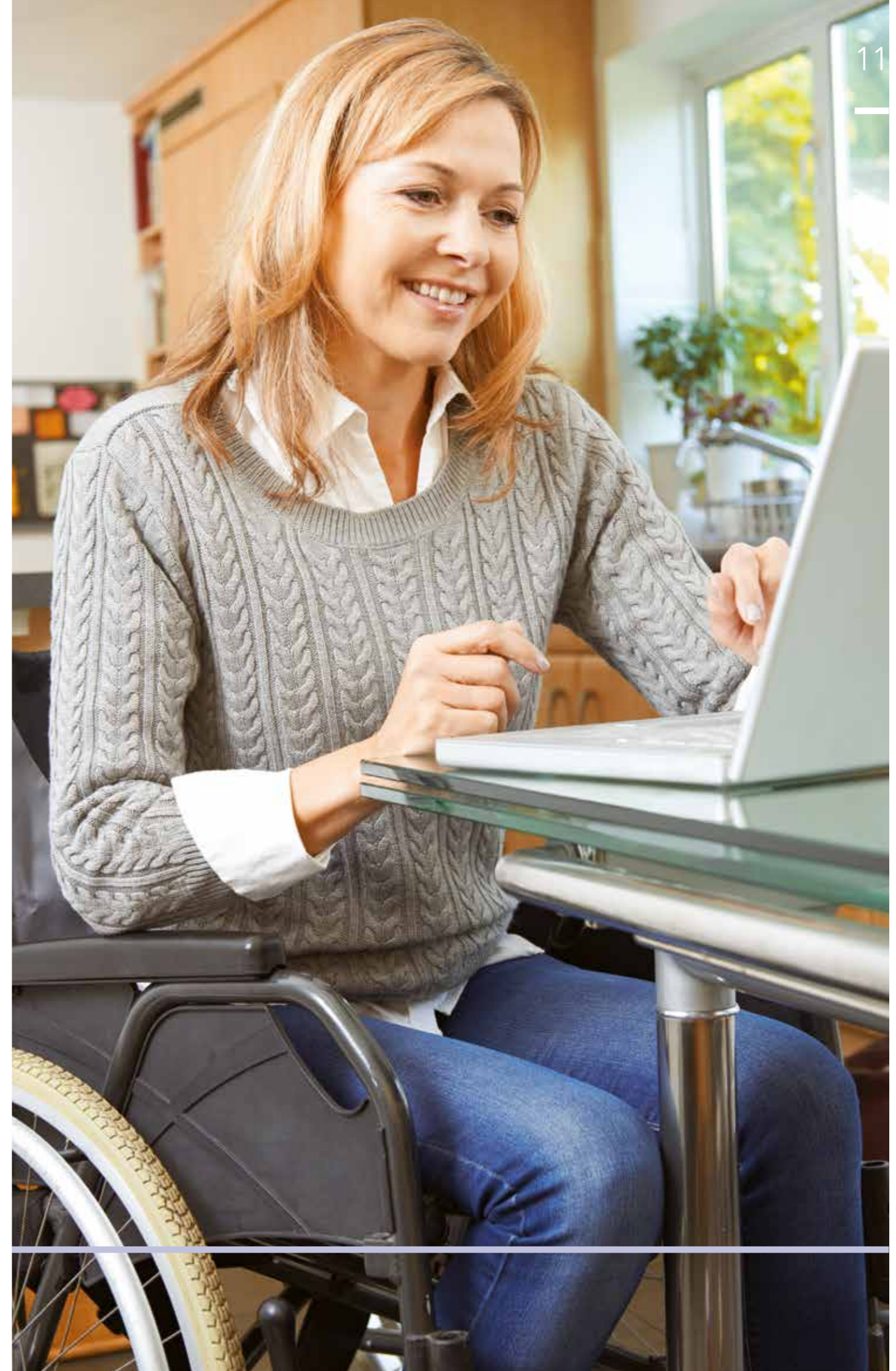
Remploy is a signatory to the SCVO/ Scottish Government Digital Participation Charter and aims to build effective working partnerships that add value and improved services and support to the disabled population of Scotland.

Remploy is working with The Scottish Government's digital transformation team to develop a pilot of an assistive digital model which incorporates accessibility, digital tools and peer to peer training and support.

This and other innovations are being developed around a user-centric approach that includes a Remploy app so individuals can receive support on the go. Remploy also offers an online repository of disability and work information based on data it has gathered as the leading authority on disability and work.

Remploy also provides digital skills training. All 60 Remploy Branches are registered as UK Online Centres, providing access, assistive technology and hands-on support to help disabled people apply their newly acquired digital confidence and skills to find a job and then use those digital skills in the workplace.

By continually innovating, the organisation tailors its services to suit the needs of disabled people and ultimately, support more people with disabilities and health conditions into sustainable employment in Scotland.

Case Study

Wheatley Group

Wheatley is a housing, care and property-management group, comprising six Registered Social Landlords, a care organisation, three commercial subsidiaries and a charitable foundation. The Wheatley Group spans 17 of Scotland's 32 local authority areas across Central Scotland, providing homes and services to over 200,000 people.

Wheatley Group developed its first Digital Strategy in 2013 with the aim of supporting its customers to go online, use the Group's online services and access affordable broadband deals. As part of its approach, the Group developed a partnership with Glasgow Kelvin College to support digital skills training in its communities and signed up to The Scottish Government's Digital Participation Charter. With that, came a commitment to support staff, as well as customers, to go online. In Glasgow, Wheatley is the lead for digital participation as part of the city's vision of becoming a digital city during 2017, supporting citizens to use the internet and participate online.

Wheatley puts its customers, many of whom live in disadvantaged communities, at the heart of everything it does and its digital strategy is no different. It has introduced a fully transactional web self-service portal to allow customers to view their customer account, pay their rent, report repairs and make appointments, when and where it suits them. New websites are being introduced early in 2017 to further improve the customer experience when using online services, and to give people accessible information, news, advice and opportunities to get involved. Apps

are being introduced to make it even more convenient for some customers to transact in the online world. Customers have co-designed the websites to ensure it's as easy as possible to find information and carry out transactions.

The Group's focus is now on staff as the next stage of supporting customers to access online services. Digital volunteers have been recruited across the Group to support the development of digital skills among staff under the banner of "Digi-Know". Interactive sessions around saving money, keeping healthy and staying safe online are planned to encourage colleagues to share their knowledge and take the fear-factor out of tablets and other mobile devices.

Another programme of digital volunteering has been designed and delivered in partnership with the Scottish Qualifications Authority. Through SQA's corporate social responsibility programme, staff volunteers support people on the Group's new Changing Lives employability programme, helping them get online and develop their digital skills. Many of these members of staff have been long-term unemployed and will need digital skills to apply for jobs and benefits at the end of the programme. Some of Wheatley's environmental staff also helped SQA to develop digital learning guides which can help first-time internet users quickly gain basic digital skills.

Supporting people to develop digital skills can be life changing. Just ask Stewart Scott, from Cranhill, who landed a job as a delivery driver

after getting help through one of Wheatley's 36 computer learning centres which offer tuition and free access to computers. Stewart said: "I got help with improving my CV. Staff put me through job courses and helped me with my applications. They introduced me to websites I didn't know about with all sorts of different jobs - it opened up a whole new world."

Cost Savings[10]

The Institute for Government estimates that the transformation process could realise savings between £1.3 and £2 billion in just three years. When local government interactions are scaled against central government interactions, the accrual of savings can be seen.[11] Using a Barnett share of these savings as a proxy, savings in Scotland could be of the order of £130 - £200 million.

Other estimates have looked at what percentage of overall spend could be saved. Estimates from NESTA suggest that digitalisation programmes could return savings of up to 13% by 2025.[12]

The Government Digital Service, which is working on digital public services at a UK level, provided estimates in 2012 of the savings related to shifting citizens towards digital channels.

These suggest that an online transaction costs:
- 20 times less than a telephone transaction;
- 30 times less than a postal transaction;
- 50 times less than a face to face transaction.

Audit Scotland documented the financial benefits of digital programmes already in place in some council areas of Scotland:

The City of Edinburgh Council

The Council is currently redesigning many of its customer care services and moving services online where possible. The Council plans to deliver annual savings of £5.9 million, through reducing the number of support staff. There are early signs that this initiative is making an impact: 40 transactions, such as school placing requests, are already available online and savings of £355,000 over the past year have been made. The Council now aims to roll out a further 153 new types of online transaction in 2016/17.

The Highland Council

The Council aims to reduce the equivalent of 54.2 full-time employees and save £1.3 million by 2018/19 through its Digital First programme. In 2014, 82,000 transactions took place online with a corresponding 10% decrease in face-to-face transactions. The Council currently offers 87 services online, such as paying rent online, and is aiming to have 40% of customer transactions online by April 2017. The Council has implemented the Improvement Service's customer portal 'myaccount'. This reduces the requirement for customers to prove their identity every time they apply, and gives customers the ability to upload scanned and photographed evidence.

(Source: Audit Scotland)

10. http://www.instituteforgovernment.org.uk/sites/default/files/publications/IFGJ4942_Digital_Government_Report_10_16%20WEB%20%28a%29.pdf
11. http://www.audit-scotland.gov.uk/uploads/docs/report/2016/nr_160317_local_government_overview.pdf
12. http://www.nesta.org.uk/sites/default/files/connected_councils_report.pdf p7

As detailed earlier, the public sector spending bill in Scotland is £68.6bn, of which 55% can be attributed to payroll[13]. The overall estimated costs of public sector employment are therefore £37.73bn. The underlying objective of the digitalisation of public services remains dual: enhanced service provision through better targeting and greater efficiency which will return financial savings.
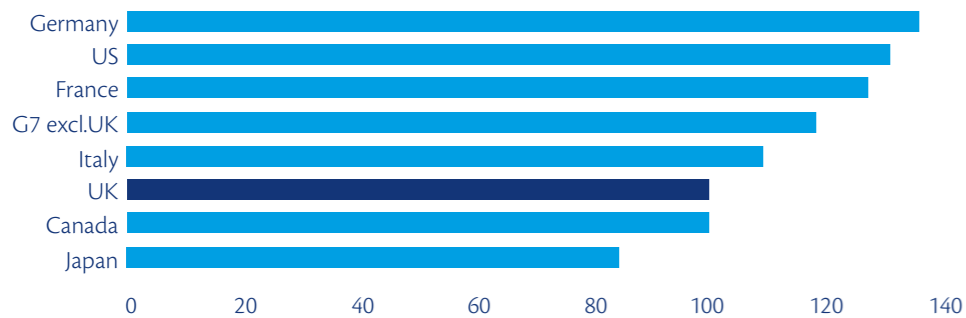
The costs of technological disruption in terms of headcount loss are already clear to see, both globally and across specific sectors. It has been asserted that manufacturing globally has seen greater job loss due to technology rather than trade. Productivity figures bear out the ability to 'do more with less' as automation and the adoption of state of the art technology sees countries such as Germany continually outperform the UK and Scotland in productivity terms. ONS publishes international comparison data which shows that the UK ranks equal 5th with Canada out of the G7 countries.

Given the heavy influence of the public sector on employment and spending in Scotland, it must embrace technological disruption if such productivity gains are to be realised. Indeed, it makes strategic sense for Scotland to become a leader in the field of digital public services.

The impacts of technological disruption have been largely hidden from view in other sectors, as job transitions have been implemented over time and changes in one sector have been absorbed by another. However, the impact will be more obvious in the public sector environment. Public services are largely delivered face to face and employment is locally based around the geographic centres of delivery. The relationships between the stakeholders involved in these transactions can be deep as some citizens are heavily engaged with the state due to their complex and multiple needs. New platform-driven business models rely on high levels of penetration, broad audiences or subscribers to operate and exist.

Customer acquisition and engagement is critical to the digital platform business model: the public sector, by legacy, already has an existing relationship with virtually every citizen and home in the country. These relationships come with vast volumes of historical data and are a source of value.

Financial services firm Deloitte LLP estimate in their *State of the State* report that 850,000 public sector jobs will be removed as a result of automation across the UK as a whole.[14] A rough estimation of the likely level in Scotland would suggest that around 85,000 jobs could be impacted through automation.

While this figure is of concern, there are opportunities within this pool of people for redeployment and retraining. At the Digital Forum delegates were also reminded that technological disruption creates jobs; the UK level demand for digitally-skilled workers is thought to be around two million by 2020.[15] The employment cost and opportunity picture in Scotland is nuanced and would require careful analysis as part of the digital transformation process.

The *State of the State* report also highlights that certain types of jobs are more at risk than others. It concludes that jobs that require interaction with people, such as in education, health, care and policing, will not be easy to automate in the near future and are therefore not currently at risk.

However, these roles will benefit from enhanced information availability and, subsequently, better informed decision-making as a result of technology and data about their operating environment. According to Deloitte, 50% of roles will not be able to be automated which reduces the potential attrition, but of course also reduces the available financial savings.

The extent to which jobs will be automated and at what pace is debatable. Researchers at the Centre for European Economic Research in Mannheim, Germany, have conducted a study for the OECD which argues that the level of automation and resultant job loss is overstated. It suggests that specific tasks rather than entire roles will be impacted and when this is taken into account only 10% of British jobs are highly susceptible to automation.[16]

The impact on employment is part of the journey to a fully digital nation and it needs to be managed, with people being made ready for the future by good access to advice and skills development throughout their careers in order to maintain their employability.

GDP per hour worked, 2015, where UK = 100
Source: http://researchbriefings.files.parliament.uk/documents/SN06492/SN06492.pdf

Country	Value
Germany	
US	
France	
G7 excl.UK	
Italy	
UK	
Canada	
Japan	

0   20   40   60   80   100   120   140

13. https://www.sbs.strath.ac.uk/economics/fraser/20160913/ScotlandsBudget-2016.pdf p52
14. https://www2.deloitte.com/uk/en/pages/public-sector/articles/state-of-the-state.html
15. http://www.developmenteconomics.co.uk/tag/o2/

16. http://www.oecd-ilibrary.org/social-issues-migration-health/the-risk-of-automation-for-jobs-in-oecd-countries_5jlz9h56dvq7-en

There is a need to get all stakeholders ready; citizens, and those who deliver public services, are at different stages in their respective digital journeys

Where Are We Now and What Is Possible?

Under normal circumstances, no project would be undertaken without a clear indication of the benefits that it would seek to achieve. The financial imperative of reforming public services adds a unique dimension to this programme. Incremental change will not be enough; rather, spending pressures demand complete service re-design to take advantage of the efficiencies that technologies offer.

There is a need to get all stakeholders ready; citizens, and those who deliver public services, are at different stages in their respective digital journeys. Indeed, citizens themselves are not on a collective, simultaneous journey and are all at varying points on a spectrum of digital literacy and engagement. Likewise, the public sector is not a single entity; some areas have responded to the changes brought about by digital disruption. The case studies highlighted earlier demonstrate this; there are examples of excellence but this is far from standard across the board.

There is a real need for citizen input - an 'outside in' approach - to make sure that expensive mistakes aren't made in service re-design. A set of citizen champions could help to engage their networks and document their requirements to ensure that the digital services being developed are fit for purpose and easy to use.

The potential cost savings that are available will alter due to a number of factors. Inevitably, given the limitations of automation, digital transformation will remove jobs and wage costs at the lower end of the public sector pay scale. Trying to understand the shape of the Scottish public sector pay bill is critical to understanding any potential gains from transformation. In their work on Scotland's Budget, the Fraser of Allander Institute highlight difficulties in analysing changes to the Scottish public sector pay bill because of the lack of published data.[17] This will also make any accurate tracking of financial savings as a result of public service transformation extremely difficult.

In order to deliver the better outcomes sought by transformation, benchmarking of where we are now against a series of defined metrics is essential, as are distinct indicators of the financial savings. To underpin this process, there must be a clear analysis of where Scotland is at the moment in terms of the digital maturity of the public sector and how much money is currently allocated to service provision within and across the sector.

There are a number of sources of information on the UK and Scotland and digital capability which are detailed in Appendix 2. None are generated from within Scotland with full oversight of the breadth of programmes currently being supported and undertaken at both Scottish and local government level and therefore do not offer a full and detailed picture of progress. Benchmarking against a specific vision for Scotland with regard to digital public services will allow progress to be highlighted and areas of underperformance to be targeted.

Transforming for Innovation and Economic Growth

Scotland's digital public service delivery transformation programme presents an unprecedented opportunity to drive innovation, increase productivity and create a knowledge base that will have international relevance and export capability.

Scotland has to face the multiple challenges of infrastructure coverage impacted by the unique geography of the country, the scale of the public sector in people and economic terms, weak macroeconomic and fiscal conditions and an ageing population in its journey through digital transformation.

The roadmap defined by Scotland will be one that others would seek to follow and, given the scale of the challenges faced here, will provide a well-tested set of solutions for others to adapt. Scotland should aspire to become a world leader in government digital transformation, creating a blueprint that will generate savings, a better skilled and adaptable workforce, strong digital capabilities amongst its public sector workforce and a truly smart and innovative society.

17. https://www.sbs.strath.ac.uk/economics/fraser/20160913/ScotlandsBudget-2016.pdf p64

Digital Scotland -Strengths, Challenges and Barriers

Scotland benefits from a number of strengths. The Scottish Government is responding to changes in the external environment brought about by digital transformation of the consumer-driven private sector landscape. It is seeking to identify and apply clear principles and build the foundations that will underpin the digital transformation of the public sector. The Scottish Government is also taking an active role in mirroring good practice examples from the UK Government Digital Service and elsewhere.

The pace of change has, however, been slow. The Scottish Government's current focus on revisiting the Digital Strategy for Scotland is welcome, but progress between strategies published in 2011 and 2013 and today is not fully evident.

The scale of the task is large. Scotland's size is usually considered to be an advantage but this may not be wholly applicable in the case of digital transformation. The development of the underlying platforms and user journeys requires intensive investment, regardless of the volume of transactions and interactions. However, these can often be developed in a modular way to introduce flexibility and allow for future adaption.

Further, innovations and underlying structures have been developed and launched in Scotland over a number of years. As long as these are properly assessed, they will provide critical knowledge and support for every programme that will contribute to full digital transformation of government at all levels.

But the key challenge of achieving large scale behavioural change in how the citizen and state interact remains.

The UK Government, through the Government Digital Service, is digitalising key large scale services such as HMRC and DVLA to create a more convenient and efficient way for citizens to transact and interact with the state. To date, Scotland has had control of fewer national level services that could be delivered digitally: while a number of transactions and interactions occurred at local level, many national services were delivered through UK Government portals. This is changing.

Further devolution through the Smith Commission and Scotland Act legislation has and will see a new suite of tax and social security powers come to The Scottish Government. Many will be linked to other benefits where data sharing would be advantageous and offer efficiencies in delivery. National level payments and grants that require application could be delivered by digital means to reduce additional administration costs. This has been recognised with the creation of a National Digital Ecosystem Unit which has the remit of simplifying processes across Scottish Government and supporting them with shared technologies.

In Scotland, basic digital skills have been supported by wide engagement with The Scottish Government-funded SCVO digital participation programme. Since 2013, SCVO has supported numerous programmes delivered through social economy sector and community organisations with some receiving financial support from the Digital Challenge Fund and other sources. These programmes are designed to assist the estimated 800,000 people in Scotland who do not have basic digital skills or experience of using digital services for themselves.

There are also a number of complementary projects and programmes which seek to support skills and innovation in order to make best use of the investment made in infrastructure to deliver The Scottish Government's world class ambition for Scotland.

CodeClan, the digital skills academy,[18] is a notable example of an innovative approach to help address the known shortfall in supply of skilled software engineers. Established as a direct result of the 2014 ICT & Digital Technologies Skills Investment Plan, with the support of Skills Development Scotland, The Scottish Government and ScotlandIS, CodeClan addresses the known shortfall in the supply of skilled software developers in Scotland through highly intensive learning programmes. Individuals with these skills are needed not only in the digital technologies industry, but increasingly across other industries. Set up initially in Edinburgh, CodeClan is opening a second location in Glasgow in early 2017, with plans for further expansion over the next two years. The overarching aim is to accelerate progress of the digital economy.

In recognition of a particular need to enhance digital capability within the public sector, the Digital Champions Development programme has been established by The Scottish Government.[19] This innovative programme across the public sector, focuses on ensuring that the people leading public sector organisations are able to understand the role that digital technologies can play in helping transform their organisations. The target audience is at chief executive and director level. Cohorts are exposed to a wide range of expertise from across the digital technologies industry, including leading consultancies, successfully innovative Scottish companies, academia and The Scottish Government's own in-house expert teams working on user needs and user journey mapping.

The Scottish Government has also set up a Digital Transformation Service[20] which seeks to provide access to digital talent to help departments and public sector organisations realise their digital ambitions.

Innovation helps drive digital transformation. To encourage the application of innovative, agile techniques to generate new solutions to known issues within the public sector in Scotland, the CivTech pilot programme[21] aims to drive the application of digital technology to improve public services and quality of life for citizens. It creates a new channel for small, innovative businesses in Scotland to access public funds and to offer their expertise to solve challenges such as designing smart roads, making better use of data and opening up access to services for citizens.

While the challenge of securing universal connectivity in Scotland is not considered minimal, population and premises coverage, where the vast majority of people actually live, is relatively high. Current coverage, as reported by Ofcom in December 2016, shows that 83% of premises can get broadband at superfast speeds of 30 Mbps or more; however, take-up of superfast services is relatively low compared with availability. On mobile connectivity, coverage of premises with voice services is 84% from all four operators and data connectivity is available to 75% of premises in Scotland. [22]

The lack of 100% universal coverage and speed variations (particularly in rural areas) are issues. However, the Digital Scotland Superfast Broadband programme is on schedule to complete by the end of March 2018 with 95% of premises having access to high speed broadband infrastructure. The mismatch between the timeline to achieve 100% availability and take-up and the pace of change required would see local government digital transformation delayed in a harmful way. Savings will not be accrued and the opportunity to use the transformation programme to create a confident digital workforce, with a skillset that will be increasingly in demand across both the public and private sectors in the coming years, will be lost.

Workers who re-train and gain a digital skillset will be able to personally benefit from their attractiveness as an employee and will benefit Scotland as a society by helping to plug the gap in digital skills. A Scottish local government digital transformation programme could generate a workforce capable of contributing in a truly meaningful way to productivity improvements and economic growth for the nation.

It is worth reflecting on the stated outcome of The Scottish Government's Reaching 100 (R100) programme which will build on the previous broadband coverage interventions procured and rolled out across Scotland. The objective of the R100 programme is that 100% of premises in Scotland will be able to access superfast broadband (30Mbps or higher) by 2021. It would be expected that universal digital public services will be available ahead of, but certainly within the same timeframe as, universal access.

Innovation helps drive digital transformation

18. https://codeclan.com/

19. http://www.gov.scot/Topics/Economy/digital/digitalservices/workforce/dgp
20. http://www.gov.scot/Topics/Economy/digital/digitalservices/dts
21. https://civtech.atlassian.net/wiki
22. https://www.ofcom.org.uk/__data/assets/pdf_file/0038/95879/CN16-Scotland.pdf

Worldview on Digital Public Services

Two well-respected international organisations, the OECD and MIT, have made clear contributions to the digital public services agenda and recommendations on the design of digital strategy.

In 2016, OECD Secretary-General Angel Gurria voiced concerns that government policy was not keeping pace with digital innovation. His warning was stark:

"Too many countries are taking a 20th Century approach to a 21st Century technology that is moving faster than any other the world has seen, the Internet is profoundly transforming the way we live and work, but we could be getting a lot more out of it. The longer we dither on the digital economy, the less benefit we will get out of it as societies." [23]

This statement suggests that the pace of service transformation and rollout needs to accelerate and that benefits are being lost as time goes by. These issues may be understood by governments but the space between strategy and delivery has a number of complexities. The OECD offers recommendations to assist and support countries with developing their digital strategies and transformation journey: [24]

What can policy makers do to spur effective and more open, innovative and participatory governments?

Set Strategic Digital Government Objectives
Taking steps to address existing "digital divides" and the need to avoid "new digital exclusions"; as well as the creation of a data-driven culture that enables open data for transparency, better service delivery and public participation.

Ensure the coherent use of technology across policy areas and levels of government
Establishing organisational and governance frameworks for effective co-ordination and integration of efforts to produce better policy outcomes and services.

Strengthen capacities to support better implementation of digital government strategies
Governments should adopt clear business cases for the use of resources on identified objectives, and should monitor results. The necessary capacities, including regulatory and legal frameworks, need to be put in place to not only capture new digital government opportunities but also to mitigate associated risks (such as security and privacy).

The OECD also cites trust in the digital economy as crucial to its development and to realising the potential of digital transformation. Their data suggest that 64% of respondents to their survey in 2015 were more concerned about privacy than they had been the previous year.

In addition to the work of OECD, a set of leading economists, technologists and investors offered a view on how the burgeoning digital economy should be approached and supported. In an open letter published in the MIT Technology Review, they set out a series of public policy changes necessary to improve economic and social wellbeing with regard to the digital economy. They suggest a more wholesale review of the functioning, the role and funding of government to respond directly to the challenges presented to society by digital transformation in every area of life:

"In summary, we believe that the digital revolution is delivering an unprecedented set of tools for bolstering growth and productivity, creating wealth, and improving the world. But we can create a society of shared prosperity only if we update our policies, organizations, and research to seize the opportunities and address the challenges these tools give rise to." [25]

Their policy recommendations were echoed at our Digital Forum held in Autumn 2016 in Glasgow to support this report. They included re-designing the education system to place even greater emphasis on STEM subjects, greater investment in infrastructure of all types and investment in basic research. Entrepreneurship should be fostered and taught and the creation of favourable trade conditions for high technology goods will boost the future economy and drive more growth and development. The policy recommendations also support an immigration policy that meets the needs of the digital economy. In the UK and Scotland, the current preparations for leaving the EU must take all of these issues into account as there is likely to be direct impact on every one of them as a result of the Brexit process.

The recommendations that have been made in this report are designed to offer practical solutions to help address some of the challenges associated with creating a truly smart, digital Scotland. There are a number of other barriers that need to be considered in the context of any ambition to rollout universal digital public services which are not necessarily unique to Scotland.

Big questions remain over how public policy and infrastructure will cope with constant technological change and technology upgrades. How to ensure that citizens keep pace with these changes and how to embed digital skills and technology into the education system will also need to be considered. Broader trends like the disruption to labour markets and the automation of low-skill jobs will generate their own challenges. Cybercrime is a key concern across both the public and private sector as is resilience to climate change events that can impact energy supply. These are difficult issues that will require broad and deep expertise and analysis, but that must be considered from the outset if Scotland is to become a sustainable, resilient, digital nation.

23. http://www.oecd.org/newsroom/world-must-act-faster-to-harness-potential-of-the-digital-economy.htm
24. http://www.oecd.org/gov/digital-government/recommendation-on-digital-government-strategies.htm

25. https://www.technologyreview.com/s/538091/open-letter-on-the-digital-economy/

Recommendations

The Digital Forum identified four key areas where measures could be targeted to support Scotland's digital journey which led to the recommendations set out at the beginning of this report. We add some further detail on the rationale for these recommendations below.

Leadership

There was a sense at the Digital Forum that the Digital Scotland imperative needs to be driven from the 'top down'. The broad implications of the digital public services transition and the data collection and sharing that goes alongside it have transformational societal and privacy impacts. Therefore, the transition needs significant authority, transparency and public policy support to ensure the correct governance arrangements are in place to make the new systems work successfully and fairly.

Local authorities combined with health and social care functions have access to enormous data pools and new digital user needs rely on the ability to share that data constructively. The protocols for this sharing need to be carefully and clearly constructed, and a high level of authority is imperative to ensure they are credible and adhered to. For that reason we make the recommendation for a Digital Leader for Scotland. The role will take a strategic position to provide oversight of future trends and advise how ever-evolving technological developments can be integrated into public services; address immediate concerns; and act as a consumer champion. It will fulfil the same function as the local authority CDO role but at a central level.

Scotland's Digital Leader would take full responsibility for progress towards a Digital Scotland, constructively challenging organisations and individuals in the public sector.

We still believe that this role should report to the Cabinet in recognition of the authority required to fulfil this responsibility and of the need to transform and digitalise the whole spectrum of government services and organisations.

It is clear that digitisation of some transactional elements of the public sector has implications for the scope of the current local authority structure. Transactional functions (benefits based grant applications and approvals, permitting, etc.) could be standardised but doing so re-shapes the role of the local authority. The Digital Leader would be able to challenge norms, bring leadership and draw private sector thinking into the transformation process. He or she would be well placed to approach the process from a strategic perspective and would aim to bring independent, fresh thinking on the areas of structural reforms which would be advantageous to optimising the delivery of services via any new digital public service platform. This will inevitably see some services that have been delivered in multiple ways in multiple locations brought together at a single citizen service point or portal and delivered centrally. Scotland's Digital Leader and local authority CDO could work in partnership to determine which services could benefit from being delivered centrally through a platform or portal.

Leadership is important to encouraging behavioural change among people who are resistant to the sorts of transitions proposed. There is a need to promote understanding across the board on the reasons for transformation, the benefits and the financial imperatives behind it. A compelling vision that is accessible and concise would be articulated by Scotland's Digital Leader. It is interesting to note that a compelling vision was a key difference between 'digital leaders' and 'digital strivers' in a recent Harvard Business Review report on the digital revolution. Setting the right culture and vision meant that digital leaders encountered far fewer barriers than digital strivers.[26]

Legacy systems were also considered by the Harvard report and found to be more dominant than budget as a barrier to digital transformation - an issue shared between the public and private sectors. Scotland's Digital Leader would forge collaborative relationships between the public and private sectors to encourage two-way knowledge sharing rather than contractual relationships. There is huge value to business more widely in extending the digitally-enabled population in Scotland and the public sector can be instrumental in driving that digital population growth.

In their predictions for 2017, Forrester state that 'Trust is Now Business Currency'.[27] Local authorities have existing trust relationships with their users and consumers, so are ideally-placed to take a leadership role to ensure that citizens are guided and serviced by a trusted entity as they go on their own individual digital journey. But central leadership will be required to ensure consistently high standards of data management across Scotland's public services.

The recommendation around data gathering, sharing and storage seeks to offer the reassurance to citizens that their data will be handled properly and that they will be in control of it themselves. Many people have knowingly or unknowingly already provided an unprecedented level of data about themselves to commercial entities and social networks without a clear understanding of how it is or could be used. There is perhaps a trade-off that people are relaxed about sharing their information if they get more relevant services and responses as a result but this transaction should be transparent and the implications clearly understood.

A compelling vision will offer direction but it is also important to understand progress. There are a number of assessments of Scotland and the UK in a digital context within Appendix 2. They demonstrate the current situation but do not chart progress or how close Scotland is to achieving the current 2020 vision. Development of the new Scottish Government Digital Strategy offers an opportunity to create metrics and a reporting system that will document our progress, capacity and expertise as a digital nation.

- The Scottish Government should appoint a high profile Digital Leader for Scotland to lead Scotland's digital transformation: to drive public and private data sharing; devise and project a compelling vision for Digital Scotland; progress action towards this vision; and contribute to economic growth through enhanced productivity of public services.

- The Scottish Government working with local authorities should devise a set of metrics that allow for annual benchmarking of performance against the Digital Scotland vision. An annual Ministerial announcement of progress would demonstrate leadership commitment.

- The Scottish public sector must build a relationship of trust with citizens that will underpin faster rollout of digital public services and put citizens in control of their digital lives. The development of a trusted 'data bank' mechanism that covers data collection, sharing and storage of personal data of citizens will require top-level leadership.

Pace of Change

The Digital Forum event also concluded that the pace of rollout needs to urgently accelerate. The following recommendations seek to drive forward progress on the good work already in place. There was agreement that the programmes and projects being undertaken are helpful and constructive but that there needs to be a step-change to make real impact and to keep pace with the external digital and technological environment, as well as the public financing pressures. Great strides have been made in extending the digital skills base in Scotland but it has to be accepted that some people may never come on the digital journey, and so identifying and supporting them is critically important. This process could also help to identify where help for skills and access should be targeted.

The new powers being devolved to Scotland mean that efficient administration is essential so the outcomes required can be delivered within the shrinking public sector finance envelope. Research from the Fraser of Allander Institute suggests that non ring-fenced services could face cuts of 10% to 17% by 2020/21 because of changes to the Scottish fiscal framework.[28] There is a need to address the engagement of citizens with the internet to support the infrastructure investments being made and to support the transformation of public services. The Scottish Government set a target of getting 95% of the under-75s online in its *World Class 2020* vision[29]; it would be interesting to revisit this in the face of the rapid increase in age of the general population.

There are other trends that Scotland needs to respond to in order to ensure that it can achieve optimum economic growth and credibly take its place as a modern, globally-focused nation. Digital platforms have critical roles in the new world of work and gig economy; and for any government seeking to track and collect taxation from citizens engaged in this. Digital is disrupting so many areas of business and changing them beyond comprehension. Scotland needs its citizens to be encouraged to take their first steps or enhance their engagement with the digital world to ensure they are not left behind.

- An audit of local authority functions and public services such as health and policing should be conducted by the service leaders, the local authority CDO and Scotland's Digital Leader to assess the impact of digital transformation on employment and to identify and prioritise the services that can be digitalised most easily and/or that will result in greatest impact.

- Public service providers must acknowledge that some people will simply never be able to manage their lives in a digital way, so there is a need to create a central complex needs or extra help unit that works across all services to support non-digital service users.

- To drive the behavioural changes required to make digital public services the channel of choice among users, The Scottish Government should create a programme of citizen digital champions: people who regularly use public services to support their needs and with whom other users can identify. These champions can tell the story of their experience and provide reassurance to those about to start their own journey.

26. https://hbr.org/resources/pdfs/comm/genpact/19767_HBR_Report_Genpact_web.pdf
27. https://go.forrester.com/wp-content/uploads/Forrester-2017-Predictions.pdf
28. https://www.sbs.strath.ac.uk/economics/fraser/20160913/ScotlandsBudget-2016.pdf
29. http://www.gov.scot/Resource/0041/00414982.pdf

Digital Skills in the Public Sector Workforce

The Digital Forum focused heavily on skills gaps in both the public and private sector workforce in Scotland. Across the board, questions of how to attract talent, develop Scotland's own talent pool and allocate the scarce resource of those with in-demand digital skills pose a huge challenge. In the context of our focus on the digital transformation of public services, the next recommendations seek to address these issues in the public sector.

- The Scottish Government, working with local authorities and other public bodies, should establish a digital workforce development programme (similar to the Digital Champions model for top-level officials) that actively supports public sector staff at all levels to invest in their own digital understanding and skills, and apply these to the workplace.

- The creation of a 'Public Sector Digital MBA' would create a pool of talent operating across both technology design and user needs analysis. This should be a flexible programme where individuals would undertake secondments across multiple organisations to progress and advise them on their own digital journeys.

Education

Scotland's education system must be capable of delivering two crucial outcomes if Scotland is to become a leading digital nation. Firstly, it must equip everyone with the information and digital skills they require to safely and confidently use digital services and to manage their online identities. Secondly, it must produce graduates with the high-level computing and digital skills that industry, both in Scotland and beyond, urgently demands. Further, it must deliver these outcomes in the context of an ever-evolving technological landscape, recognising that the development of digital skills is a continuous journey with no end point.

Participants in the Digital Forum recognised the significant, and increasing, global shortage of people with in-demand digital expertise (e.g. data analysts, digital producers, software engineers) as a key opportunity for Scotland. A broad range of stakeholders have been striving to enhance the design and teaching of digital skills and computing science in Scotland for some years, including Education Scotland, the Scottish Qualifications Authority (SQA), Skills Development Scotland (SDS), local authorities, schools, Computing at Schools Scotland, ScotlandIS, colleges, universities, through the Scottish Information and Computer Science Alliance (SICSA), trade unions and the British Computing Society (BCS).

Some initiatives have focused on improving the digital skills of all, for example the Scottish Government's September 2016 strategy Enhancing Learning and Teaching through the use of Digital Technology.[30] Others have focused on filling industry skills shortages, such as The Scottish Government and SDS-led Skills Investment Plan for Scotland's ICT and Digital Technologies Sector.[31]

Nevertheless, industry continues to struggle to find and recruit appropriately-skilled employees; a challenge that in Scotland (and the UK) may become even greater if access to the EU workforce is curtailed. The number of Computing Science teachers has steadily fallen, with latest figures showing that 17% of schools in Scotland have no computing specialist.[32]

There needs to be more fluidity and permeability between industry and education if the teaching of digital skills and computing science in schools, colleges and universities is to stay current with fast-moving technological developments. While there will be disparity in levels of pay between the private and education sectors, there are wider benefits to teaching, such as a more family-friendly working pattern, that could be promoted to attract professionals to teaching roles, at least for a period of time. Such fluidity, and broader close partnership between industry and the education sector, is vital if Scotland is to match the skills and experience of its graduates with ever-evolving industry needs.

- The Scottish Government must provide high-level leadership to demonstrate the priority that should be given to embedding digital skills across the school curriculum, and to computing science as a core science. It should work closely with education and industry stakeholders to support and build on current successful initiatives and to further develop close partnership between the private and education sectors.

Conclusion

It is impossible to have all the answers to the digital dilemmas created by transitioning to digital public services in Scotland. The pace of change in industry and technology means that there will always be a certain amount of 'catch-up' required.

The benefits of making this transition, however, are many. It will help to protect frontline services over a longer term, bringing in efficiencies where they are appropriate; it will upskill Scotland's population; and it will help create closer bonds between citizen and state as the relationship becomes more personalised. A Digital Scotland will see improved economic growth and will export its knowledge to others, having created the vision, worked to achieve it and having overcome the challenges faced by both the public and private sector when it comes to digital.

Infrastructure rollout has presented some enormous challenges for Scotland but these are steadily being overcome. There is a need now to focus budgets, ambition and intelligence on moving the relationship between citizen and state from analogue to digital.

We must accept that this journey will never be over; as a nation Scotland, along with others, will be in a state of constant evolution. Digital disruption has begun and will spread to all areas of life. The future is a world of ongoing disruption that state and citizen will have to adapt to. To change the mindset and provide signposting, good leadership is needed to prepare us and to guide us.

Progress in this area would see more engagement with the public sector through digital channels, innovative service delivery via digital means, Scotland being viewed externally as a benchmark and the public sector matching or outperforming the private sector in digital delivery and user engagement. The message of this report is clear: digital is here. It is an enabler but it needs public sector leaders in Scotland to light the way. The challenge is for the public sector to take the reins.

January 2017

30. http://www.gov.scot/Topics/Education/Schools/ICTinLearning
31. http://www.skillsdevelopmentscotland.co.uk/media/35682/ict___digital_technologies_sector_skills_investment_plan.pdf
32. http://www.cas.scot/latest-report-on-cs-teacher-numbers/

Appendix 1

**'Smart Citizens, Smart City Regions'
Digital Forum**
(Autumn 2016 - Glasgow)

Claire Mack	SCDI
Ian Osborne	KTN UK
Brian Hughes	Collectivworks
Ross Tuffee	DOGFI.SH Mobile Ltd
Grant Wilson	Hitachi Data Systems Ltd
Andy Williamson	The Scottish Government
Ronan McGarry	Ordinance Survey
Eddie Turnbull	The Scottish Government
Stuart Mackinnon	FSB Scotland
Gordon Bell	Stirling Enterprise Park Ltd (STEP)
Sally Kerr	The City of Edinburgh Council
Michael Fourman	The Royal Society of Edinburgh
Mark Begbie	Censis
Craig McArthur	East Ayrshire Council
Nadeem Sarwar	Organised Health Technologies
Donald McLaughlin	Cisco Systems Ltd
Atanas Christev	Heriot Watt University
Gareth Lush	Datavita
Trish Quinn	The Scottish Government
Stuart Law	The Scottish Government
Michael McLafferty	The Scottish Government
Graham Kerr	Censis
Joanne Boyle	Digital Health & Care Institute
Scott Cunningham	My Diabetes My Way
Mark Dames	BT Scotland
Katherine Eland	IBM United Kingdom
Barbara Géczy	This Is Milk
Dr Jim Hamill	Future Digital Leaders
Susan Lennox	The Royal Society of Edinburgh
Svea Miesch	ScotlandIS
Wendy Regan	Deloitte LLP
Matthew Revett	Grayling Public Affairs
Fiona Young	PwC
Vincent Hamill	Future Digital Leaders
Graeme Scott	IBI Group
Tommy Laughlin	ScotlandIS
Martin Jordan	Equator
Douglas Shirlaw	COSLA
Graeme Gordon	Internet For Business
Gareth Williams	SCDI

Appendix 2

Digital Benchmarking Measures - UK and Scotland

Barclays Digital Index

Places the UK 4th in their pool of 10 countries globally. UK scores higher on digital policies than on individual empowerment because of a reported lack of confidence in skills amongst UK workers. The UK scores less well on protecting data and devices despite an eagerness to learn. In terms of digital index, the UK's highest rating is for knowledge and attitude, which covers digital 'savviness' and willingness to learn and try new technologies. The lowest rating attained by the UK is around researching and evaluating, which is about search methods and skills and evaluation of information. Overall, the UK however ranks above the US, China and India in this global index but is second bottom on metrics around content creation and coding representing a net consumption situation.[33]

EU Digital Economy and Society Index

This index rates the digital economies of member states and provides an average across the EU28. Given Scotland is not a member in its own right the UK is assessed. The UK ranks above the EU28 average across all metrics, particularly on connectivity, human capital and use of the internet. It rates only just above the EU28 on measures around integration of digital technology and digital public services suggesting room for improvement in these areas and potential to gain an insight into best practice and knowledge transfer from members such as Denmark. Overall the UK ranks 6th in the EU and has seen an improvement in its rating in the last year due to greater use of social media, online news sources and an increasing number of STEM graduates.

Lloyds Consumer Digital Index

This analysis suggests a link between higher digital literacy and higher financial capability and seeks to rate Scotland against the UK average. The ratings are relatively encouraging, suggesting that only 15% of those sampled seem to be restricted by their digital competency not matching their financial competency skills. In all areas using the metric grid of high/low financial capability versus high/low digital capability, Scotland sits within 1% of the UK. The key finding is, however, that those people with high digital capability can access savings over three and half times higher than people with lower digital capability, with annual savings of £88 as opposed to £24 for those with digital skills.[34] The report also suggests that Scottish people use the internet to make savings on clothing more than the rest of the UK. They are about the same as the rest of the UK in making savings on utility bills and use the internet less than the rest of the UK to save money on holidays. 43% of people agree that the internet helps them to feel a part of society which is similar.

Ofcom Internet Use and Attitudes

The 2016 survey found that internet reach (use of the internet at home, work or library, broadband take-up and use of mobile phones to access the internet) was in line with UK figures. However, the detailed analysis presented some more challenging data. The breadth of internet use in Scotland was consistently lower amongst a number of metrics that Ofcom measured: banking online, use of social media and watching TV online were all lower than the UK average. Most importantly in the context of this report, going online to look up information on health or on government and council services were also lower in Scotland than the UK - 31% versus 44% for health information and 28% versus 35% for government or council services information.[35]

NESTA CITIE: The Scotland Analysis

The report looks across Scotland's seven major cities and reports that Scotland as a whole is faring well on average. Edinburgh and Glasgow rival some key international cities such as Tel Aviv and Paris. Across the board, Scotland is performing less well in digital terms than collated North American cities but there are elements of excellence within the Scottish cities portfolio to build upon. The '8th City' project with £10million of European funding secured through the Scottish Cities Alliance which is expected to attract further matched funding is an exciting prospect for the future development of the digital landscape in Scotland.[36]

33. https://digitalindex.barclays/map
34. http://www.lloydsbank.com/assets/media/pdfs/banking_with_us/scotland.pdf
35. https://www.ofcom.org.uk/__data/assets/pdf_file/0023/63950/Internet-use-and-attitudes-2016.pdf
36. http://citie.org/assets/uploads/2016/10/CITIE_-Scotland_FINAL.pdf

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