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 benefits 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, induce action towards this vision, and contribute to economic growth through enhanced productivity of public services.
• The Scottish Government, working with local authorities, should devolve 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.

In January 2016, SCDI, Scotland’s, 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 Scotland2 and public sector finances through demographic change, slow economic recovery and have significantly decreased in demand.7

The 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 public services in order to avoid a potential £1bn funding gap by 2016. In the immediate years after the report, The Scottish Government responded by highlighting the priorities for reform in its 2011 public sector strategy, Renewing Scotland’s Public Services3, 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 was also published in 2011 and made recommendations to improve Public Sector ICT infrastructure, using digital to potentially save up to £870m.4 The Scottish Government National Public Service Strategy and Action Plan5, 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 2016, 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 sector finances facing significant cuts, debt and increase in demand.

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 continue longer than expected due to slow economic recovery and have significantly reduced public service funding. While 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 for 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.
Digital Scotland - Benefits to Citizens and Businesses

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 every 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, 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 regular 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 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.

- 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
- Happiness Index launched to measure the happiness and satisfaction of the public with digital public services - aim to be the world’s happiest city
- 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
- Dubai Digital Timeline
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:

- 96.4% of respondents were confident the system was secure
- 95.9% felt that the system helped them manage diabetes better
- 94.2% felt that the system helped them understand results
- 95.9% were happy to monitor changes over time
- 88.2% felt that the system helped manage diabetes better
- 89.3% were satisfied with the system
- 96.4% felt that the system was significantly better for diabetes self-care in Scotland

In September 2016, data for the parent 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 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.

Case Study

My Diabetes My Way

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 areas 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 stops, 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, self is almost unrecognisable from the norms of ten years ago. Adaptable, 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 models 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.
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 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
Remploy
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 its 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 ‘Dig-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 SQAs 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 - I opened up a whole new world.”

Cost Savings

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. Using a Barnett share of these savings as a proxy, savings in Scotland could be of the order of £150 - £200 million.

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

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; 46 transactions, such as school placing requests, are already available online and savings of £355,000 per 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 542 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 30% 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)
As detailed earlier, the public sector spending bill in Scotland is £68.6bn, of which 55% can be attributed to payroll13. The overall estimated costs of public sector employment are therefore £37.7bn. 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 whole14. 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 202015. The employment cost and opportunity 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 automation16.

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 automation16.

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.

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15. http://www.developmenteconomics.co.uk/tag/o2/
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.

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.

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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 adaptability.

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.

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. 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 expert knowledge 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.

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.

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 to ensure digital interactions with government and supporting citizens.

The overarching aim is to accelerate progress of the digital economy. 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.

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 CivicTech pilot programme 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.

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 (£100 million) programme which will build on the previous broadband coverage interventions procured and rolled out across Scotland. The objective of the Reaching 100 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
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.”

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.

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).

“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.”

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.

OECD offers recommendations to assist and support countries with developing their digital strategies and transformation journey.

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The Digital Forum identified four key areas where measures could be targeted to support Scotland’s digital journey:

1. **Leadership**
   - There was a sense at the Digital Forum that the leadership role was critical. The role would need to be clearly understood and the responsibilities well-defined.
   - Legacy systems were also considered by the Harvard report and found to be more dominant than budget as a barrier to digital transformation. 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 that consider the digital journey. The 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.

2. **Costs and Budgeting**
   - Review of cost-benefit analysis between the public and private sectors to ensure the right technologies are selected.
   - The Scottish public sector must build a sustainable technology budget with a high level of authority and credibility.

3. **Skills and Workforce**
   - Development of new professional roles. People may never come on the digital journey, in Scotland but it has to be accepted that some areas of business and changing them beyond their needs and with whom other users can engage.
   - The Scottish Government has a target of getting 95% of the under-7s online in its World Class 2020 vision, it would be interesting to revisit this in the face of the rapid increase in age of the general population.

4. **Sharing and Privacy**
   - The ability to share that data constructively. The protocols for this sharing need to be clear and must be adhered to. For that reason and in order to ensure that it can achieve optimum economic growth and credibility take its place as a modern, globally focused nation.

### Recommendations

- **Leadership**
  - The Digital Forum recommended that Scotland’s Digital Leader take the role of leading Scotland’s digital revolution. Setting the right culture and expectations is critical.
  - The Digital Forum recommended that the role would be a central level role.
  - Several existing roles could function as the local authority CDO role but at a central level.

- **Skills and Workforce**
  - 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 credible will be articulated by Scotland’s Digital Leader.
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- **Costs and Budgeting**
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### 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 a sense at the Digital Forum 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 financial pressures.

  - Scotland’s Digital Leader should appoint a high profile Digital Leader for Scotland to lead Scotland’s digital transformation.
  - 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.

  - Scottish public sector needs to incentivize public sector to support non-digital service users.
  - Scotland’s Digital Leader should set a target of getting 95% of the under-7s online in its World Class 2020 vision.

- 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 CDOs and Scotland’s Digital Leader to assess the impact of digital transformation on employment and to identify and prioritise the services that can be digitised 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 complex and 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 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 could 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 (CAtS), 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. 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.

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 specialists.

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 reaching, 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.

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.

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 improving the relationship between citizen and state from analogue to digital.

To change the mindset and provide a new capability of state and citizens to adapt to. The public sector in Scotland (and the UK) is moving into a world where knowledge workers increasingly need to apply digital skills.

Conclusions

The benefits of making this transition, however, are many. It will help to protect frontline services over a longer term, bringing in efficiencies that allow a greater emphasis on upskilling Scotland’s professionals, and it will help to create closer bonds between citizen and state as the relationship between state and citizen will have to adapt to. To realize this mindset and provide the right type of leadership is needed to re-imagine the public sector working in the digital era.

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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 improving the relationship between citizen and state from analogue to digital.

The benefits of making this transition, however, are many. It will help to protect frontline services over a longer term, bringing in efficiencies that allow a greater emphasis on upskilling Scotland’s professionals, and it will help to create closer bonds between citizen and state as the relationship between state and citizen will have to adapt to. To realize this mindset and provide a new capability of state and citizens to adapt to. The public sector in Scotland (and the UK) is moving into a world where knowledge workers increasingly need to apply digital skills.
Digital Benchmarking Measures - UK and Scotland

Barclays Digital Index

Placed 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 constant creation and coding representing a net consumption situation.35

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 just 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.36 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 to the rest of the UK.36

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.37

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.38