

**ACHIEVING SCOTLAND'S FULL
POTENTIAL IN A DIGITAL WORLD:
A DIGITAL STRATEGY
FOR SCOTLAND**



**Digital
Scotland**



Scottish Government
Riaghaltas na h-Alba
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POTENTIAL

**ACHIEVING SCOTLAND'S
FULL POTENTIAL IN A DIGITAL
WORLD: A DIGITAL STRATEGY
FOR SCOTLAND**



**DEREK MACKAY
CABINET SECRETARY FINANCE
AND THE CONSTITUTION**

MINISTERIAL FOREWORD

As Cabinet Secretary with overall responsibility for our Digital Strategy, I am determined to ensure that Scotland continues to prosper in an increasingly connected and competitive world. This demands that we look outwards, learn from international experience and assess our progress against that made by other progressive countries. It requires us to work with experts to monitor the development and implications of new and emergent technologies such as the internet of things, cloud computing, sensors, artificial intelligence and machine learning. It also demands that we challenge old ways of thinking about the services we offer and the organisations that deliver them.

Back in 2011, the Scottish Government published a Digital Strategy designed to extend connectivity, promote the digital economy, digitise public services and promote digital participation. Good progress has been made in delivering this agenda and we are now in a position to develop and describe future actions and priorities that build upon a platform of success.

Realising Scotland's full potential in a Digital World sets out our plans for ensuring that we put digital at the heart of everything we do – in the way in which we deliver inclusive economic growth, reform our public services and prepare our children for the workplace of the future. It's a strategy for Scotland, not just the Scottish Government. It recognises the profound challenges that digital poses for the nature of work, for society and for both the world and domestic economies. It also accepts that no single organisation can hope to have the answers to these questions and therefore looks to create a culture and environment of partnership in which we take collective action to ensure that nobody is left behind and we all remain safe, secure and confident about the future.

I have been really encouraged by the creative and innovative ideas that people across Scotland, and indeed beyond, contributed to the development of this plan. It suggests to me that there is great confidence in Scotland's future in a digital world and a collective determination to ensure that we reap the benefits of the digital age. I hope that this document provides a vision around which we can build the collective action that this demands.

INTRODUCTION

Technology transforms the way in which we live our lives. It connects us in new and different ways. It puts more power into the hands of the users of services and offers new insights and opportunities for those who provide them. It creates a platform and a momentum for innovation and has the potential to fundamentally redefine the relationship between the public sector and the people it serves.

Much of this is exciting and positive for our country. The opportunity to develop new products and services; to create and collaborate across cultures and borders and develop successful, global businesses at a scale and a speed that was previously unimaginable. The chance to reduce the costs and increase the quality of public services, change the way in which we learn, work and live and access information and knowledge from around the world.

However, we also recognise that with these opportunities come some risks. Digital disrupts traditional jobs and industries, puts new pressures on our right to privacy and has the potential to create new forms of social exclusion. It generates new opportunities for criminal exploitation and raises serious questions and challenges for national and international security.

The Scottish Government will ensure that **Scotland is recognised throughout the world as a vibrant, inclusive, open and outward-looking digital nation.**

**IT PUTS MORE POWER INTO THE
HANDS OF THE USERS OF SERVICES
AND OFFERS NEW INSIGHTS AND
OPPORTUNITIES FOR THOSE WHO
PROVIDE THEM.**



OUR VISION IS OF A COUNTRY WHICH:

- > Stimulates innovation, welcomes investment and promotes its digital technologies industries
- > Develops internationally competitive, digitally mature businesses across all sectors
- > Designs and delivers digital public services around the needs of their users
- > Shares and opens up non-personal data as a source of innovation and efficiency
- > Has a public sector that operates on contemporary, digital, platform-based business models
- > Is led by a Government that “gets digital” and supports its staff to operate in digital ways
- > Provides high quality connectivity across the whole of our country
- > Is recognised internationally as a natural test bed for innovation in connectivity
- > Focuses its education and training systems on expanding its pool of digital skills and capabilities
- > Tackles the current gender gap in digital skills and careers
- > Enables everybody to share in the social, economic and democratic opportunities of digital
- > Creates the conditions which safeguard workers and enables Scottish society to address concerns about the digital world
- > Is secure and resilient to cyber threat and risk.

In a world which is changing so rapidly, a digital strategy developed at a fixed point in time cannot hope to provide all the answers. What it does do however, is describe the initial steps we will take in what will be a long and unpredictable journey and, in particular, describe how we will ensure that Scotland is able to anticipate and react, in an agile way, to the ever-changing opportunities of the digital age.

**WE WILL ENSURE THAT SCOTLAND
IS ABLE TO ANTICIPATE AND REACT
IN AN AGILE WAY.**

VISION

**WE WANT TO HARNESS THE
BENEFITS OF DIGITAL ACROSS
OUR ECONOMY AND DELIVER A
STEP-CHANGE IN PRODUCTIVITY.**

SUCCESS



SUMMARY OF ACTIONS

IN ORDER THAT SCOTLAND FULFILS ITS FULL POTENTIAL IN THE DIGITAL WORLD,
WE WILL:

- > Launch a new Digital Growth Fund to address the current undersupply of digital skills
- > Extend our Digital Boost programme to give advice and support that improves the level of digital maturity amongst businesses in every part of Scotland
- > Use City and Region deals to maximise the role that digital innovations and infrastructure can play in delivering both economic and inclusive growth
- > Create the conditions in which our digital technologies industries can thrive, working with industry to meet a shared objective to employ 150,000 in digital technology roles over the next 5 years
- > Design key public services in areas such health and social care, justice and social security around the needs of their users
- > Establish all new government organisations as digital businesses and ensure that all digital services developed by Scottish Government meet our Digital First Standard
- > Implement tough new assurance processes for Central Government projects with the power to stop projects that do not meet user needs or represent good value for money
- > Introduce shared technology platforms as a core part of the process of public service reform
- > Engage with the public to build an understanding of how their data is being used for the public benefit, and of the arrangements in place to guarantee the security of their data
- > Ensure that every premise in Scotland is able to access broadband speeds of at least 30 Megabits per second by 2021
- > Urge UK Government and Ofcom to apply the “outside-in” principle when auctioning spectrum for 5G deployment and ensure that operators deliver coverage to our most rural areas before they deploy in urban centres
- > Launch a new digital schools programme, expand the number of school coding clubs and provide teachers with the skills and resources required to use digital to enrich their teaching
- > Work with our schools, employers and skills providers to tackle the persistent gender gap in digital skills and careers
- > Use the Year of Young People as a platform to establish a clear commitment to digital rights and responsibilities that empower people to access the digital world creatively, knowledgeably and fearlessly
- > Launch a new round of funding for community digital inclusion projects and expand Scotland’s Digital Participation Charter to get more organisations involved in a national movement to promote digital skills
- > Ensure that our Critical National Infrastructure is secure and resilient against cyber attack

PLATFORM FOR FUTURE SUCCESS – ACHIEVEMENTS SINCE 2011

The Scottish Government published [Scotland's Digital Future: A Strategy for Scotland](#) back in 2011. It looked at digital opportunities and challenges facing Scotland at that time and set out actions to improve our digital infrastructure, promote digital participation, develop a greater range of digital public services and stimulate the digital economy. Significant progress has been made in each of these areas, providing a platform upon which our updated strategy will build.

Infrastructure

[Digital Scotland Superfast Broadband \(DSSB\)](#) programme achieved its initial target of delivering access to fibre broadband to 85% of premises in Scotland by March 2016 and is on track to make this 95% by the end of 2017. Over 700,000 homes and businesses across Scotland now have access to superfast broadband and we have created a fibre spine that will support future generations of fixed and mobile connectivity.

[Community Broadband Scotland \(CBS\)](#) has helped extend broadband access to over 1,400 premises across 17 community projects and is actively supporting over 100 communities.

In 2014, we relaxed planning legislation to making it easier for mobile operators to support better deployment of the telecoms infrastructure. In June 2016, we published the [Mobile Action Plan](#) – the only such Action Plan amongst UK and devolved Governments – setting out plans to tackle mobile not-spots, further reform the planning system, use publicly-owned assets for telecoms and take full advantage of the opportunities provided by the new 4G-based Emergency Services Network.



Participation

Between 2011-15, the percentage of adults using the internet for personal use increased from 73% to 82%. The gap in internet use between the most and least deprived areas of our country that stood at 29% back in 2007 had fallen to 16% by 2015, with Scotland now enjoying the highest level of basic digital skills amongst any of the four nations of the United Kingdom.¹

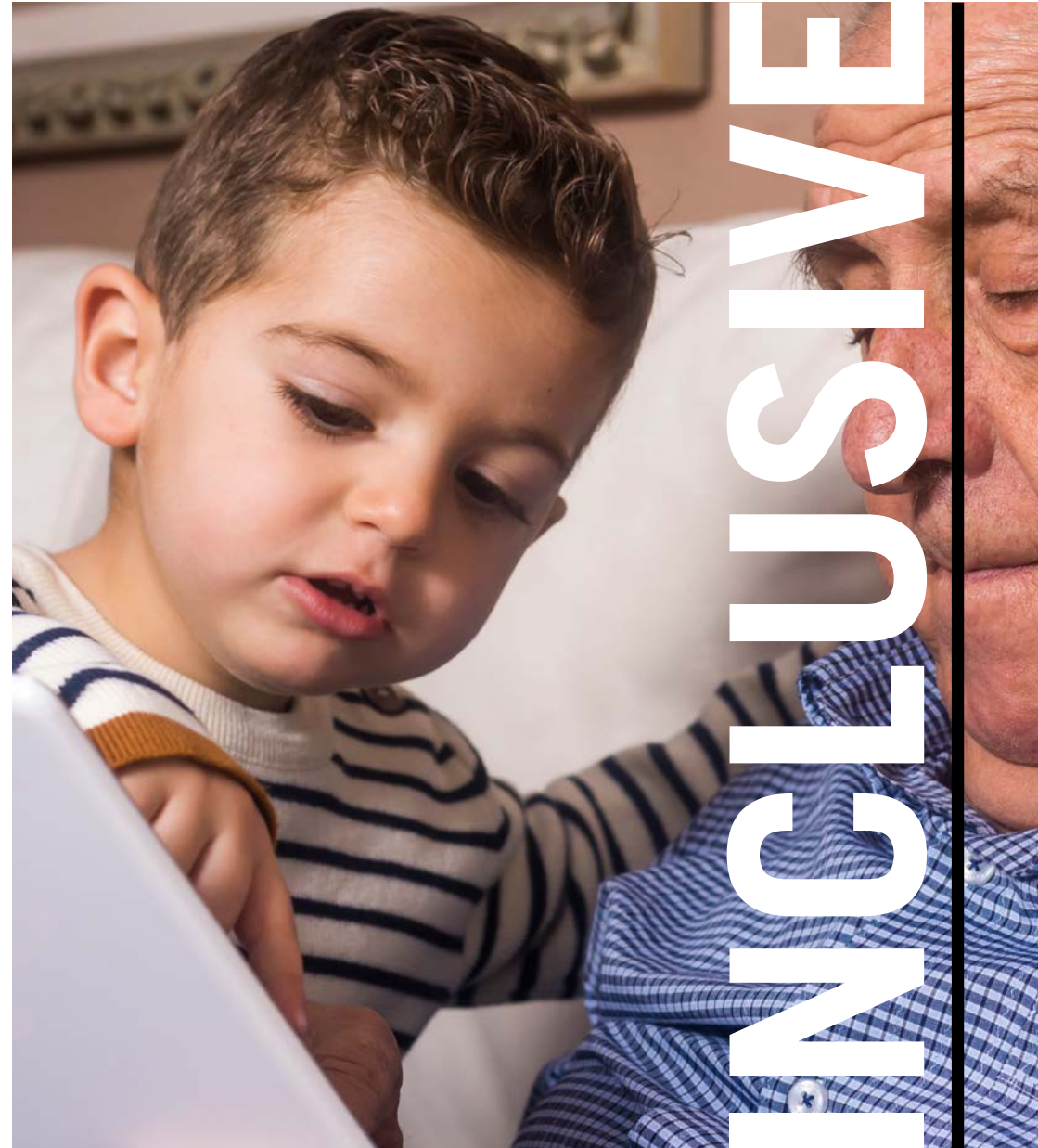
In April 2014, the Scottish Government published [A National Framework for Local Action](#) and partnered with the Scottish Council for Voluntary Organisations (SCVO) to lead its implementation. The Scottish Government invested over £1 million and announced a [Challenge Fund](#) which has since supported 127 local projects across the country supporting the development of basic digital skills. This ongoing investment has supported over 15,000 people who need the most support to go online and benefit from our digital world. Additionally, Scotland's Digital Participation Charter has secured commitment from over 300 public, private and third sector organisations to build the digital skills of their workforce, customers and service users. SCVO has also leveraged an additional £800,000 funding for digital projects from the European Regional Development Fund, BT Scotland and the Big Lottery.

There has been a 20% increase in broadband access at home amongst social housing tenants (42%-62%) since 2014. The Scottish Government has worked with partners to develop a [Digital Participation Toolkit](#)² for social housing providers, supported the Wheatley Group to trial new forms of connectivity in Glasgow and seen Castlerock Edinvar implement broadband access in all its sheltered accommodation for just under £1.00 a week per household.

We have funded the extension of free public Wi-Fi to 96% of all libraries in Scotland and have recently introduced funding for 3-D printers and technical support. In partnership with CoderDojo and the Glasgow Science Centre, we extended coding clubs into five areas of deprivation supporting 4,900 young people and in 2016 and worked with Skills Development Scotland to extend extra-curricular coding activities as part of the Digital Xtra programme.

¹ Go On UK Digital inclusion map (2015)

² <http://digitalinclusionandhousing.scot>





Public Services

Our digital strategy committed the Scottish public sector to simplifying public services, improving service delivery and sharing public sector data. Since that time, the Scottish Government has launched Revenue Scotland and seen almost 98% of its tax returns completed online. We have launched mygov.scot as the central point of access for information and replaced traditional paper-based services with online options for building standards and planning applications. [The CivTech](#)[®] pilot has demonstrated the potential for engaging small businesses in developing innovative solutions to public service challenges, whilst the [Scottish Wide Area Network](#) (SWAN) has already generated savings of over £30 million.

Scottish local authorities have made huge strides in digitising local services including paying bills online, reporting repairs and accessing a range of common and personal information. They have collaborated on common approaches to Online School payments, seen 180,000 people take up an online myaccount and been at the forefront of the use of SWAN. The appointment of a Chief Digital Officer demonstrates the ongoing commitment of local authorities to cross-sector working.

NHSScotland's website now lists an impressive collection of digital improvements,³ with recent examples including Patienttrack, an electronic monitoring and early warning system that has significantly reduced cardiac arrests in Fife, digital support for young people with mental health problems, and a new clinical support system for Diabetes in NHS Lothian and NHS Tayside. The Digital Health and Care Institute has brought together academics, the NHS and businesses to promote and commercialise innovation in digital health and social care.

The skills shortage in the public sector has been tackled with the launch of the [Digital Transformation Service](#) (DTS) in August 2015. This has already completed digital projects with 25 central government organisations. We have also run a [Digital Champions Programme](#) for more than 120 senior public and voluntary sector staff to build awareness of the potential of digital transformation within their organisations.

³ <http://www.ehealth.nhs.scot/case-studies/>

Economy

Our 2011 Strategy, followed up by a separate report in April 2013,⁴ committed to Scotland being at the forefront of the digital economy and pledged that digital technologies would be an integral part of our transition to a low carbon economy. This was embodied in the launch of a “Business Excellence Partnership” which included digital businesses and our Enterprise and Skills agencies. The Partnership subsequently invested £7 million in initiatives promoting the digital maturity of Scotland’s businesses. These included [DigitalBoost](#), a national programme of workshops, one-to-one support and online advice, designed to show how digital approaches and capability can help businesses improve and grow, a Digital Vouchers scheme that has helped over 500 companies meet costs of investing in digital technology and [#hellodigital](#),⁵ a state-of-the-art centre in Inverness, showcasing digital technology to SMEs. The Partnership has also overseen a programme of support for Scotland’s tourism industry⁶ which builds on the recognition of digital as a key priority in the Tourism Scotland 2020 Strategy.

We have developed effective partnerships with industry to improve the digital maturity and skills of our people and businesses. Over the last 6 months, Google’s Digital Garage in the Mitchell Library in Glasgow, including a number of local roadshows, has trained thousands of small businesses and individuals, while many more took advantage of the support offered through free online courses.

We have also made £8.5 million available through the Partnership to support a programme, managed by Skills Development Scotland, to tackle shortages in digital skills across Scotland. This has supported the launch of CodeClan, Scotland’s accredited and industry-led digital skills academy, Digital World,⁷ a marketing campaign designed to promote careers in the technology sector, and Digital Xtra which has so far invested £400,000, through two rounds of funding, to fund digital technology-related extra-curricular activities in Scotland’s schools.

4 <http://www.gov.scot/Topics/Economy/digital/digitalservices/workforce/dgp>

5 <http://hellodigital.scot>

6 <https://www.scottish-enterprise.com/services/develop-your-organisation/digital-tourism-scotland/overview>

7 <https://www.digitalworld.net/>



“DIGITAL ISN’T OPTIONAL. DIGITAL TRANSFORMATION IS A GLOBAL PHENOMENON, HAPPENING AT PACE ACROSS OUR ECONOMY AND IS A CORE DRIVER OF PRODUCTIVITY AND INCLUSIVE ECONOMIC GROWTH.”

KEITH BROWN, CABINET SECRETARY ECONOMY,
JOBS AND FAIR WORK



98% OF SCOTTISH BUSINESSES HAVE INTERNET ACCESS.



SCOTLAND’S DIGITAL SECTOR CONTRIBUTED £4.45 BILLION TO GVA IN 2014.



EMPLOYMENT IN THE DIGITAL SECTOR WAS 64,100 IN 2015.



TOTAL DIGITAL SECTOR EXPORTS WERE £4.24 BILLION IN 2015.

Digital Scotland:

- > Stimulates innovation, welcomes investment and promotes its digital technologies industries
- > Develops internationally competitive, digitally-mature businesses across all sectors of the economy

Our economic goal is to see Scotland ranked in the first quartile of countries in the world on productivity, wellbeing, equality and sustainability. It is therefore critical that Scotland is at the forefront of the global digital economy.

We want to harness the benefits of digital technology across our economy and deliver a step change in productivity. Some of our businesses are already embracing new technology, particularly in life sciences, financial services, creative industries and sustainable tourism. But too many businesses are yet to fully embrace technology and make use of data which could enhance innovation and productivity.

“I SET UP MY BUSINESS TO CREATE PERSONALISED, BRONZE CAST CLAN CRESTS FOR THE NORTH AMERICA MARKET. DIGITAL BOOST PROVIDED ME WITH ADVICE AND SUPPORT TO HELP GROW MY BUSINESS. THE CONTINUATION OF DIGITAL BOOST IS A WIN-WIN FOR BUSINESSES LIKE MINE, MORE OF WHOM WILL NOW BE ABLE TO LEARN THE SKILLS NEEDED TO SUCCEED IN AN INCREASINGLY DIGITAL WORLD.”

GAVIN BAIN, OWNER, CELTIC3D

We will work with leading industry figures to provide leadership that will inspire and raise the digital ambitions of Scottish businesses. Then, as part of the second stage of the Enterprise and Skills Review, we will focus on practical action that enables companies to attract digitally skilled staff and recognise and harness the benefits of disruption in their markets.

We welcome the commitments within the recent UK Digital Strategy on the part of leading organisations, such as Google, BT and Accenture, to extend new and existing skills programmes across the UK. We will work with these organisations in a collaborative

spirit to support the best possible realisation of these goals across Scotland.

“SCOTLAND CAN BE THAT ‘INNOVATION NATION’. WE HAVE ALL OF THE RAW MATERIALS: TALENT FROM OUR WORLD-CLASS EDUCATION INSTITUTIONS AND FROM OUR ESTABLISHED BUSINESSES; INCREASING LEVELS OF RISK CAPITAL INVESTMENT FROM BOTH ANGEL AND VENTURE CAPITAL. WE ARE AT AN IMPORTANT TURNING POINT FOR THE SCOTTISH TECH ECOSYSTEM; THERE IS A GROWING MATURITY WITHIN THE SECTOR WITH THE RECENT GLOBAL SUCCESSES OF SKYSCANNER, FANDUEL AND FREEAGENT, BUT A RISK THAT SKILLS IN COMPANY BUILDING AND SCALING ARE LACKING IN ORDER TO BUILD MORE COMPANIES LIKE THESE, AT AN INTERNATIONAL SCALE.”

JAMIE COLEMAN, CODEBASE

We will support businesses to grasp the opportunities of digital to develop new products and services, promote e-commerce, reduce costs or open new markets at home and abroad. The open sharing of digital capabilities between our agencies will allow an ever-increasing number of businesses to benefit from the support they offer.

GROWTH

We want to create some of the best conditions in the world for the digital sector to flourish. Our start-up community is already developing a great reputation, with particular strengths in financial technology, data and digital health care. The best-selling entertainment product of all time – Grand Theft Auto V – was designed by Rockstar North in Scotland, whilst companies such as Skyscanner have demonstrated the potential of recent start-ups to scale rapidly and achieve global success.

However, there is no room for complacency. Most, if not all, industrialised economies recognise their own digital sector as an engine of growth, meaning that our businesses and the universities that underpin them are now competing for international talent. This requires us to communicate our academic and business strengths with confidence across the world, and to demonstrate that Scotland is led by a Government which promotes international collaboration and uses the levers at its disposal to support its indigenous digital businesses.

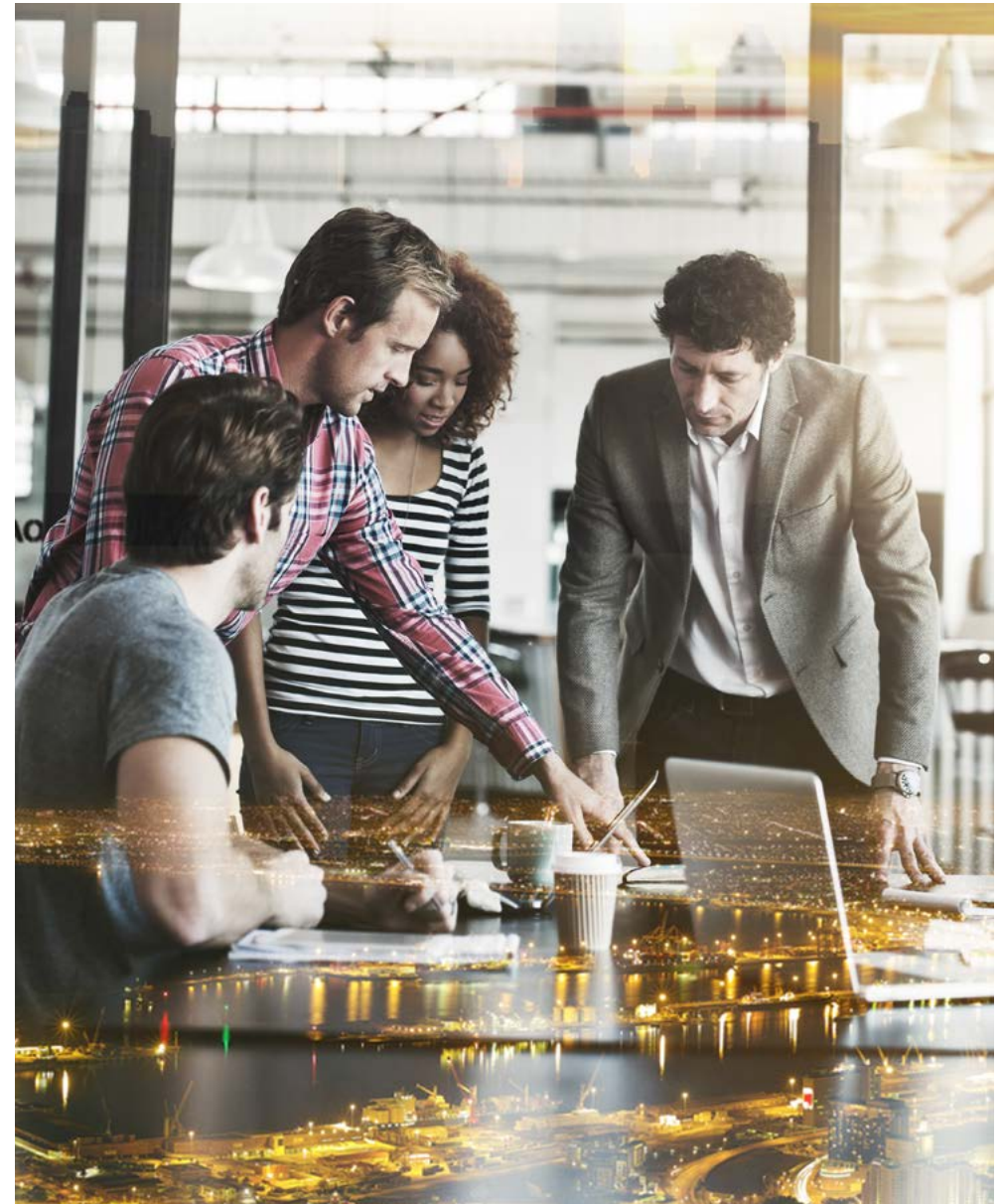
“WE WELCOME THE SCOTTISH GOVERNMENT’S INVESTMENT IN DIGITAL EDUCATION AND ITS AMBITION TO NURTURE A WORLD-LEADING ENTREPRENEURIAL AND INNOVATIVE NATION. WE ARE COMMITTED TO CONTINUE TO INVEST IN FREE DIGITAL SKILLS TRAINING AVAILABLE TO EVERYONE, SO THAT NO MATTER WHERE YOU LIVE IN SCOTLAND, YOU CAN START A BUSINESS, LAUNCH THE NEXT BIG IDEA, OR FIND OPPORTUNITIES TO EXCEL IN WHAT MATTERS MOST TO YOU.”

**RONAN HARRIS, GOOGLE MANAGING DIRECTOR
UK & IRELAND**

The European Commission estimates that a fully-functioning Digital Single Market (DSM) could add €415 billion to the EU’s GDP. Scottish companies are well-placed to contribute to this growth, and to benefit from the opportunities which the DSM will create. However, Brexit puts these opportunities at risk, and also presents a serious threat to both research funding from Europe and access to the key skills and talent upon which businesses across our economy increasingly depend.

Industry believes that the number of people employed in digital technology roles across Scotland has the potential to rise to 150,000 over the next five years. We will work in partnership with the industry to help achieve this goal, by:

- > Promoting Scotland's strengths on a world stage and proactively encouraging venture capitalists to focus on our country
 - > Collaborating with digital industry experts in developing Government economic policy
 - > Catalysing communities of talent to grow and develop in our cities and other key locations, so that entrepreneurs, innovators and technical experts can exchange ideas and develop new solutions together
 - > Safeguarding the ability of Scotland's universities and digital businesses to attract the best talent from around the world, despite the threat to freedom of movement presented by Brexit
 - > Leveraging the data resources of the public sector to stimulate inclusive economic growth
 - > Making a sustained capital investment in the connectivity and platforms required to support business growth and innovation across Scotland
- > Enabling investment through, for example, our Scottish Growth Scheme which will deliver guarantees and loans to high growth, innovative SMEs which are more likely to be digitally active, such as Fintech start-ups
 - > Working with industry to tackle both short and long term skills shortages, widening the talent pipeline and increasing the number of pathways into the workplace
 - > Building on the success of our Innovation Centres in bringing together the public sector, business and academia to realise the potential of Scotland's world-leading research in informatics and data science



ACTIONS

ACTIONS TO SUPPORT DIGITAL TRANSFORMATION ACROSS THE WIDER ECONOMY:

- > Launch a new Digital Growth Fund to address the current under-supply of digital skills
- > Extend our Digital Boost programme to give advice and support on digital issues to businesses in every part of Scotland
- > Develop a common, single sign-in and authentication process for businesses seeking access to online support services and information
- > Use the enterprise and skills review to better integrate the digital capabilities of our Enterprise and Skills agencies
- > Establish an independent Expert Advisory Panel to provide guidance and share their insights on how Scotland can deliver inclusive growth and take advantage of the growing collaborative economy
- > Update our comprehensive study of digitalisation amongst Scotland's businesses during 2017, and measure the changes in our Digital Economy Maturity Index
- > Promote the uptake of "Cyber Essentials" as a baseline standard to support the digital security of all organisations
- > We will use City and Region deals to maximise the role that digital innovations and infrastructure can play in delivering both economic and inclusive growth, building on the examples set in Aberdeen and Inverness
- > Increase adoption of digital technologies within manufacturing through the delivery of our action plan "A Manufacturing Future for Scotland"
- > Support Scotland's Creative Industries Partnership to drive innovation amongst our creative industries, particularly through the better use of data; engaging with emerging technologies; the development of digital public spaces and enhancing partnerships with Innovation Centres

ACTIONS

ACTIONS TO SUPPORT GROWTH IN THE DIGITAL SECTOR:

- > Introduce a pilot project in Edinburgh aimed at growing rapidly scaleable digital businesses which can compete on a global stage
- > Develop specific options to promote and support a thriving Fintech sector, working with the Scottish Financial Enterprise's Fintech strategy group and with SDI on attracting inward investment into the sector
- > Forge partnerships and ambitious initiatives between public sector and industry to capture the economic benefits which data driven innovation offers to Scotland's businesses
- > Represent Scottish interests in the development of the Digital Single Market, and to mitigate as far as possible the impact of Brexit – in partnership with industry, and through the delivery of this strategy
- > Make it easier and more attractive for small digital businesses to take advantage of public sector procurement opportunities and to work with us
- > Appoint a global digital ambassador to promote Scotland as a place to build and locate digital technologies industries
- > Open up the non-personal data held by the public sector to enable innovators to develop new insights and services by linking it to other sources of data created by our use of smartphones, social media, websites etc.
- > Support delivery by the Scottish Cities Alliance of the £24 million collaborative smart city projects from the Scottish European Regional Development Fund Programme for 2014-2020
- > Collaborate with the Smart Cities Scotland programme, and the opportunities it presents to attract investment, hi-tech businesses and talent to Scotland
- > Use the Universities Innovation Fund to forge new collaborations with digital thought leaders from around the world

“DIGITAL AND DATA ARE IRRESISTIBLE FORCES THAT DRIVE INNOVATION IN OUR PUBLIC SERVICES – THEY OPEN UP NEW CHOICES AND POSSIBILITIES FOR US ALL.”

DEREK MACKAY, CABINET SECRETARY FINANCE AND THE CONSTITUTION



86% OF ONLINE PUBLIC SERVICES USERS ARE SATISFIED WITH THE OVERALL QUALITY.



73% OF USERS WERE SATISFIED WITH THE USEFULNESS OF MYGOV CONTENT.

Digital Scotland:

- > Designs and delivers digital public services around the needs of their users
- > Shares and opens up non-personal data as a source of innovation and efficiency

Scotland will be seen as an international pioneer of citizen-led service design. The development and implementation of a *Scottish Approach to User Research and Service Design* will ensure that digital public services will be designed with, and for, the people who use them. Our Digital First Standards enshrine a commitment to co-production which is already seen in, for example, the creation of User Experience panels to help us shape the way in which we will provide Social Security benefits in Scotland following the transfer of powers from the UK Government.

“DIGITAL WILL BE KEY TO THE TRANSFORMATION OF HEALTH & SOCIAL CARE. NHS CHIEF EXECUTIVES ARE COMMITTED TO THE MAJOR OPPORTUNITIES FOR THE DEVELOPMENT AND APPLICATION OF DIGITAL SOLUTIONS TO EMPOWER INDIVIDUALS, FACILITATE GREATER SELF-MANAGEMENT AND TRANSFORM HOW OUR CITIZENS ENGAGE AND INTERACT WITH A 21ST-CENTURY HEALTH SERVICE.”

JEFF ACE, CHIEF EXECUTIVE, NHS DUMFRIES & GALLOWAY AND CHAIR, NHS CHIEF EXECUTIVE’S GROUP

Digital Public Services must be secure and resilient, easy to find and easy to use. **They must empower users and enable rapid feedback on their performance.** Information and services will therefore be provided through mygov.scot rather than through a series of disparate websites and we will provide a secure approach to online identification and verification which will command the trust of the Scottish public. We will also make sure that no-one is left behind, by offering face-to-face and other forms of assistance wherever necessary, so that everybody can take advantage of the opportunities that digital brings.

Digital enables us to transform the delivery of health and care, giving real choice to people across Scotland. Benefits include the ability to manage your own care, have a video consultation or be supported in your own home by a care worker who can use mobile technology to access the data and records they need. This provides the opportunity to use remote monitoring to track your health condition and anticipate problems at the earliest possible stage.

We will create an efficient, user-centred and digitally-enabled justice system and open up a wealth of new learning and teaching opportunities within our education system. We will also develop intelligent transport systems which will increase capacity and support the further development of smart integrated ticketing across buses, trains, trams and ferries throughout the country.

The Scottish Government will create the conditions which encourage continuous innovation and improvement in our public services. The Chief Digital Officers, or equivalents, in Scottish Government, local government, NHSScotland and the third sector will be encouraged to develop and implement joint action plans and we will share our ideas and experiences internationally with other progressive digital governments. This will include work to explore the potential of new and emerging technologies such as blockchain.

WE CAN DO THE BEST

Our CivTech programme has already demonstrated how it is possible to engage digital entrepreneurs and small businesses in developing solutions to sometimes intractable problems and we will continue to find ways of encouraging such innovation in the future. At the same time we will identify and remove outdated legislative or “custom and practice” impediments to delivering the digital services that people want.

Data holds the key to unlocking innovation in public services. **Better data sharing can generate new insights, stimulate new ideas and deliver potential savings to the public sector of more than £1billion.**⁸ Such benefits will, however, only be realised if people in Scotland trust us to hold their data securely and use it in appropriate ways.

**“SCOTLAND HAS THE POTENTIAL
TO BECOME THE DATA CAPITAL OF
EUROPE.”**

**CHARLIE JEFFREY, SENIOR VICE PRINCIPAL,
UNIVERSITY OF EDINBURGH**

⁸ For example, the Policy Exchange estimated that we have the potential for the public sector across the UK to save £16billion-£33billion. “The big data opportunity” (2012) <https://policyexchange.org.uk/the-big-data-opportunity/>

This understanding lies at the heart of Scotland’s Open Data Strategy published in February 2015, which sets out our ambition for making data open and available for others to use and reuse. We are already seeing benefits in areas of public service as diverse as promoting effective energy efficiency in Scotland’s housing stock, increasing the number of people within our further and higher education system and predicting future demand for social care. Collective data agreements are helping to widen access and reduce the costs of key data sources across the Scottish public sector.

Scotland already has an impressive set of high quality public sector data and the largest concentration of internationally significant and world-leading informatics research in the UK. We have invested significantly in organisations such as Datalab, the Administrative Data Research Centre, the Farr Institute and Urban Big Data Centre and created a platform which will **help Scotland become recognised as an attractive place to develop data-enabled enterprises, conduct research, innovate and contribute to the development of data skills.**

**“DATA CHANGES EVERYTHING,
OPENING UP NEW CHOICES AND
POSSIBILITIES FOR OUR PUBLIC
SERVICES, OUR BUSINESSES,
OUR WELLBEING.”**

**GILLIAN DOCHERTY, CHIEF EXECUTIVE,
DATA LAB**

ACTIONS

ACTIONS TO RE-DESIGN SCOTLAND'S DIGITAL PUBLIC SERVICES:

- > Use the opportunity offered by new powers to redesign and simplify the process of applying for social security benefits
- > Create a national portal for health and care services, giving people better access to their health care information and records
- > Publish a new Digital Health and Social Care Strategy in 2017
- > Make it easier to access historical and other records online
- > Deliver a predominantly online 2021 Census, whilst maintaining public trust in the process
- > Enable the digital recording of evidence, reports, decisions and judgements throughout our justice system and a digital platform to store all information relevant to a case or individual in one secure location
- > Trial electronic voting solutions to increase democratic participation
- > Work with stakeholders, privacy interests and members of the public to develop a robust, secure and trustworthy mechanism by which an individual member of the public can demonstrate their identity online
- > Provide community health workers with remote access to up to date information
- > Work with the transport industry to deliver a National Pay As You Go ePurse for transport and enable travel across Scotland on a single saltirecard smart card
- > Drive the future transformation of Scotland's planning system to provide a simpler and more consistent online experience across Scotland
- > Introduce a series of new digital services within the conveyancing process, including digital access to discharges, standard securities and dispositions
- > Expand our CivTech programme to enable more entrepreneurs to build businesses that improve the delivery of public services

ACTIONS

ACTIONS TO ENABLE CHANGE AND INNOVATION THROUGH DATA:

- > Engage with the public to build an understanding of how their data is being used for the public benefit, and of the arrangements in place to guarantee the security of their data
- > Drive the adoption of open data standards across the public sector to improve efficiency and inter-operability
- > Develop a platform that allows citizens and researchers to see what datasets are held about people and organisations in Scotland, and what details those datasets contain
- > Make non-personal data about people and businesses in Scotland easier to access and use by publishing, in open format, data behind all official statistics on **statistics.gov.scot**
- > Improve arrangements to support secure, legal and ethical data sharing where this is for public benefit
- > Deliver a series of pathfinder data analytics and Earth Observation projects
- > Provide access to Scotland's education sector to the Point Cloud representing the three bridges across the River Forth
- > Deliver a skills programme with Data Lab to increase the pipeline of new data scientists, educate leaders in delivering value from data innovation, and develop the data analytics skills of the existing workforce
- > Ensure that the UK-wide Digital Economy Bill works for Scotland's data ambitions
- > Invest in new collective data agreements such as a national capture programme for LiDAR

**“A WORLD-CLASS DIGITAL SCOTLAND
REQUIRES A WORLD-CLASS DIGITAL
GOVERNMENT.”**

**DEREK MACKAY, CABINET SECRETARY FINANCE
AND THE CONSTITUTION**

Digital Scotland:

- > Has a public sector that operates on contemporary, digital, platform-based business models
- > Is led by a government that “gets digital” and supports its staff to operate in digital ways

Digital Transformation is about far more than merely providing public services on line. These services form an infrastructure that is critical to the economic success of this country and must be provided in ways that makes sense to our users, rather than the ways in which we have chosen to organise ourselves. We will therefore [match the expansion of digital public services with reform of the structure and ways of working of the organisations that deliver them.](#)

**“WE WILL ACHIEVE OUR VISION THAT,
BY 2020, ALL COUNCILS IN SCOTLAND
WILL BE DIGITAL BUSINESSES.”**

**LORRAINE MCMILLAN, CHIEF EXECUTIVE, EAST
RENFREWSHIRE COUNCIL AND CHAIR OF THE
LOCAL GOVERNMENT TRANSFORMATION BOARD**

Our approach demands that we:

- > Simplify and standardise ways of working across the public sector so that it becomes easier to use our services and we don’t waste time and money reinventing wheels
- > Deploy common technologies that can be built and procured once rather than multiple times
- > Create common digital platforms for services that will encourage Scottish public and voluntary sector organisations to innovate in the delivery of public services
- > Make better use of cloud-based solutions as a source of both cost reduction and service innovation
- > Provide transparent information on the costs and performance of public services and respond quickly to feedback from the users of our services
- > Ensure that the platforms and technologies are both secure and resilient

**“DIGITAL BUSINESS MODELS AND A
DIGITAL CULTURE IN GOVERNMENT
CAN TRANSFORM PUBLIC SERVICES
IN SCOTLAND.”**

**PROFESSOR ALAN BROWN
EXECUTIVE DIRECTOR, SURREY CENTRE FOR
THE DIGITAL ECONOMY**

We will mandate the use of these common capabilities across Scottish Government and its Executive agencies and work with partners to introduce them more widely across the public sector. [This moves us away from a public sector in which individual organisations do everything for themselves](#), to one in which standardised processes are delivered across traditional boundaries. This will increase levels of transparency around the costs and quality of our services and enable our organisations to re-prioritise their work and move staff from standard “back office” work – which could in future be provided on their behalf by another organisation – towards front-line service delivery where the human interaction is vital.

The Scottish Government can only lead the digital transformation of the public sector if it becomes a truly digital organisation in its own right. This requires leaders who truly “get digital” and understand the value that a digital business model can bring. It needs us to attract, retain and develop staff who understand user needs, have good situational awareness and who can implement agile programmes and make appropriate technology choices. It also means that we must support these staff with the technology they require to work smartly and collaborate effectively with their colleagues and stakeholders.

The transformation of the Scottish Government will be enabled by digital and we expect all our delivery organisations to set out their plans and priorities for change. It will, of course, take time to embed a deep digital culture into government and to realise the benefits in terms of efficiency and service quality that this will bring. However, the Scottish Government is well placed to do this. Our long-established commitment to working in partnership with other sectors of the economy and the way in which we are organised into a series of flexible, outward-looking directorates, rather than a more traditional structure of rigid government departments make it easier to realise the collaborative potential of the internet. Critically, the introduction of new powers in areas such as social security, provides us with an opportunity to introduce digital business models on “green field sites” and use the learning, along with experience from around the world, to transform the more established parts of our organisation.

We recognise, of course, that significant investments in digital/ ICT carry with them an element of risk. Our [digital first standard](#) and the widespread use of value chain mapping will allow us to identify commodity services that can be procured from the market and those which require innovative digital solutions where a more agile approach is needed in order to minimise risk. At the same time, we are committed to introducing a tough new assurance process. This will give expert assessors from within and, where necessary, outside government, the ability to stop programmes of work that are falling short of the required standards.



ACTIONS

ACTIONS TO TRANSFORM THE PUBLIC SECTOR:

- > Introduce shared technology platforms, starting with common approaches to publishing information, applying for services, and making/receiving payments
- > Transform the administration of grant funding and licensing across the Scottish Government with an initial focus on our rural and environmental services
- > Move public sector data hosting to a cloud environment wherever this is appropriate in terms of security and efficiency
- > Launch a Registers platform to host registers of information that will be held once and offer single sources of secure and accurate information
- > Develop and extend Civtech across the Scottish public sector and work through Public Contracts Scotland to enable greater collaboration with a growing Scottish market
- > Extend the use of existing national assets such as mygov.scot, GLOW, National Entitlement Cards (NEC) and SWAN across the public sector
- > Establish a new group of senior academics to challenge our thinking, identify best international practice and ensure that Scotland remains at the cutting edge of digitally enabled public service reform

ACTIONS

ACTIONS TO BUILD A DIGITAL GOVERNMENT:

- > Establish all new government organisations as digital businesses based on a clear digital business model
- > Ensure that all digital services developed by the Scottish Government meet our Digital First Standard
- > Implement tough new assurance processes for central government projects with the power to stop projects that do not meet user needs or represent good value for money
- > Review all major software licensing arrangements to ensure that they represent value for money
- > Mandate the use of common platforms and infrastructure, including cloud hosting, as appropriate across the Scottish Government
- > Introduce a new digital, data and technology profession within the Scottish Government to attract and retain the talent we need across these disciplines
- > Enhance the Central Government Digital Transformation Service to provide access to scarce digital skills including software developers, user researchers, business analysts and digital programme managers
- > Launch a new Skills Academy for Government and open its courses and support across the public service landscape
- > Offer all public sector leaders the opportunity to attend a “Digital Champions” programme
- > Equip Scottish Government staff with modern digital tools which will enable them to work seamlessly from different locations and engage more closely with the communities they serve
- > Introduce broader cloud-based collaboration tools which extend to delivery partners who do not operate on the government secure network

“ECONOMIC SUCCESS DEMANDS THAT OUR ABILITY TO BENEFIT FROM DIGITAL IS NOT LIMITED BY WHERE WE CHOSE TO LIVE OR WORK.”

FERGUS EWING: CABINET SECRETARY RURAL ECONOMY AND CONNECTIVITY



88% OF PREMISES HAVE NEXT GENERATION BROADBAND ACCESS.



83% OF PREMISES HAVE SUPERFAST BROADBAND ACCESS.



46% OF RURAL PREMISES HAVE SUPERFAST BROADBAND ACCESS.



AVERAGE BROADBAND DOWNLOAD SPEEDS ARE 35 MBITS/S ACROSS SCOTLAND AND 15 MBITS/S WITHIN RURAL AREAS.

Digital Scotland:

- > Provides high quality connectivity across the whole of our country
- > Is recognised internationally as a natural test bed for innovation in connectivity

Connectivity is a vital part of our national infrastructure. People think about it in the same way as gas, electricity and water. Businesses depend on it to improve productivity, support customers and open new markets. And we see investment in fibre, masts and sensors as being as vital to economic growth as more traditional investments in the physical infrastructure of roads, rail and buildings.

“ACHIEVING 100% SUPERFAST BROADBAND COVERAGE WILL FURTHER BOOST SCOTLAND’S STATUS AS A WORLD-CLASS, DIGITALLY-CONNECTED NATION. DIGITAL CONTRIBUTED £10.3 BILLION TO THE SCOTTISH ECONOMY LAST YEAR AND, WITH 82% OF FIRMS PROVIDING SIGNIFICANTLY MORE DIGITAL CONTENT THAN THEY WERE THREE YEARS AGO, SCOTLAND IS LEADING THE WAY. THE SCOTTISH GOVERNMENT IS CREATING AN ENVIRONMENT THAT SUPPORTS PRIVATE INVESTMENT IN BROADBAND ROLLOUT AND THIS IS DELIVERING BENEFITS. VIRGIN MEDIA RECENTLY ANNOUNCED ULTRAFAST ROLLOUT TO OVER 360,000 PREMISES IN SCOTLAND, TWO-THIRDS OF WHICH WILL BE FTTP, TAKING OUR FOOTPRINT TO WELL OVER 1 MILLION PREMISES IN SCOTLAND. THIS WILL GROW AS WE ASSIST IN THE DELIVERY OF THE 100% COMMITMENT.”

MARTIN MCFADYEN, HEAD OF SCOTLAND, VIRGIN MEDIA BUSINESS

Telecoms is a reserved matter which means that, like defence and foreign affairs, it remains the responsibility of the UK Parliament. However, the central importance of digital connectivity to Scotland’s economy has meant that the Scottish Government has had to become increasingly active in this area. We know that in the past, too many areas of our country have not shared in the benefits of good quality connectivity. We therefore want to work in partnership with the UK Government, other parts of the Scottish public sector, the UK regulator Ofcom and with industry to ensure that this doesn’t happen in future. [The Scottish Government will use its powers to create an environment where the private sector can invest](#), while ensuring that Ofcom and the UK Government do more to shape the regulatory environment in a way that recognises and responds to the unique challenges posed by Scotland’s low population density and geography.

National and local government in Scotland have worked well together in recent years to extend access to high quality connectivity in areas where investment could not be justified by commercial providers alone.

Our investment through the Digital Scotland Superfast Broadband programme has greatly enhanced Scotland's digital infrastructure, creating a fibre spine that runs through most of mainland Scotland and reaches out, through sub-sea connections, to some of our most remote rural and island communities.

We want to build on this, to create high bandwidth, easily accessible fibre infrastructure across all of Scotland. This will provide a platform on which we can:

- > **Extend superfast broadband access to all by 2021**, while encouraging the growth of ultrafast services
- > Revolutionise performance by connecting fibre to masts, small cells and sensors and deliver further increases in speed and reliability as we move towards symmetric gigabit connectivity
- > Extend international fibre links, reducing our reliance on London and building greater resilience and diversity into our networks
- > Make targeted investments in mobile infrastructure that address gaps in 4G coverage, while laying the groundwork for 5G deployment in Scotland

- > Develop a national LoRa-wide area network that supports Machine-to-Machine networking and **puts Scotland at the cutting edge of the Internet of Things**, while supporting our businesses to innovate and take full advantage of the economic opportunities offered by IOT.

We will continue to invest in digital infrastructure, focusing on areas that are beyond the reach of commercial suppliers. But our planned investment is likely to have a different focus in future.

We want to promote an “outside-in” approach. We will prioritise future public investment on our hardest to reach rural areas while ensuring that our UK partners prioritise rural coverage when it comes to setting future coverage obligations. At the same time, we will encourage commercial suppliers to address remaining gaps in urban Scotland.

We will bolster Scotland's backhaul capacity. This will underpin a wide range of connectivity services, from superfast broadband and 4G today, to ultrafast broadband and 5G tomorrow.

100% coverage will not be delivered by one technology, one supplier or one procurement. We are planning a phased approach that will see a range of projects progressed from 2017 onwards. This includes a project, supported by the European Union, to bring new sub-sea fibre and microwave connections to our island communities.

We will launch a public consultation on our new intervention area for the Reaching 100% programme in Q2 2017. This will move away from an approach based on postcodes, to one based on premises, removing the anomaly where some premises have missed out of the benefits of previous programmes. We will launch new procurements later in 2017, with deployment anticipated from 2018.

The outside in approach will also drive our approach to extending mobile coverage. Scotland was left poorly served as a result of previous UK-wide spectrum auctions, which prioritised revenue at the expense of rural coverage. We will work with the UK Government, Ofcom and industry to ensure that history does not repeat itself.

The action plan we have agreed with the four UK mobile operators commits us to working together to develop an infill programme to address mobile “not-spots”. We will set out our plans by June 2017, with new procurements to follow soon after.

“AFTER MANY YEARS OF DOING WITHOUT, COLL HAS NOW GOT A FANTASTIC 4G MOBILE MAST WHICH HAS BEEN QUITE REVOLUTIONARY. WHERE I LIVE – AT THE END OF THE LINE – THE PHONE LINE WAS SO CRACKLY IT WAS A STRUGGLE TO SPEAK WITH CLIENTS AND UNDERSTAND THEM. I PREVIOUSLY HAD A LANDLINE AND SATELLITE BROADBAND BUT HAVE ACTUALLY CANCELLED BOTH BECAUSE THE 4G SERVICE HERE IS SO GOOD AND SO FAST. THE WORLD-WIDE WAIT IS NO MORE.”

PETE MACKAY, COLL REMOTE SUPPORT

We will also ensure that Scotland is at the forefront of 5G. Working with Scottish Futures Trust, we have already established relationships with key 5G players – from academia, industry, 5G working groups and regulatory bodies. We will formalise these relationships to drive the development of 5G in Scotland – and in so doing, ensure that Scotland receives a fair share of UK-Government funding to support 5G trials.

We will make Scotland a natural test bed for innovation in connectivity. This requires us to build links with businesses across the world to attract their investment against international competition and develop a robust case that demonstrates the impact that an investment in connectivity can have on sustainable and inclusive economic growth.

ACTIONS TO

- > Ensure that every premise in Scotland is able to access broadband speeds of at least 30 Megabits per second by 2021
- > Launch a public consultation in Q2 2017 to confirm the areas in which we need to intervene to deliver 100% broadband coverage and then start the procurement process soon after to begin deployment in 2018
- > Ensure that 4G coverage is available throughout most of Scotland and on all key transport routes – A and B roads and main railway routes
- > Urge the UK Government and Ofcom to apply the “outside-in” principle when auctioning spectrum for 5G deployment and ensure that operators deliver coverage to our most rural areas before they deploy in urban centres
- > Establish a “5G Hub” in partnership with industry and academia to ensure that Scotland is at the forefront of 5G research and deployment
- > Develop our understanding of the Internet of Things and how Scotland can benefit
- > Ensure that all of Scotland’s cities have internationally competitive connectivity
- > Extend Scotland’s Internet Exchange across multiple sites, ensuring greater diversity and improving internet performance for end users
- > Use Scotland’s business rates system to incentivise the commercial delivery of new fibre and mast infrastructure
- > Take advantage of Building Standards policy to help ensure that new buildings are digital ready
- > Support Community Broadband Scotland to deliver a pipeline of 16 community networks across the country with potential to connect up to 8,000 premises
- > Develop, test and make decisions based on robust models of investment drawing on the very latest international data on the economic and social value of digital connectivity

“DIGITAL SKILLS ARE FUNDAMENTAL TO THE LIFE CHANCES OF OUR PEOPLE AND THE ECONOMIC SUCCESS OF OUR COUNTRY.”

JOHN SWINNEY, DEPUTY FIRST MINISTER AND
CABINET SECRETARY EDUCATION AND SKILLS



**15 UNIVERSITIES
PROVIDE COMPUTER
SCIENCE COURSES.**



**IN 2015, 19% OF
HIGHER COMPUTING
STUDENTS WERE
FEMALE.**



**26% OF BUSINESSES
ARE TAKING STEPS
TO DEVELOP THEIR
CURRENT EMPLOYEES’
DIGITAL SKILLS.**



**4 IN 10 BUSINESSES
ARE FULLY EQUIPPED
WITH SUFFICIENT
TECHNOLOGY SKILLS.**

Digital Scotland:

- > Ensures its education and training systems expand its pool of digital skills and capabilities
- > Tackles the current gender gap in digital skills and careers

Digital skills sit alongside literacy, numeracy and health and wellbeing as the essential platforms for lifelong learning. These skills are required to study almost every subject at school and beyond, apply for jobs, get some of the best deals on goods and services and maintain friendships with people across the world. They are a core requirement for careers in almost every aspect of business life, be that sales, marketing, procurement, research, finance or HR.

“IN MID CALDER PRIMARY SCHOOL, OUR VISION IS THAT EDUCATION SHOULD PREPARE YOUNG PEOPLE FOR JOBS THAT DO NOT YET EXIST, USING TECHNOLOGIES THAT HAVE NOT YET BEEN INVENTED, TO SOLVE PROBLEMS OF WHICH WE ARE NOT YET AWARE. WE BELIEVE PROVIDING LEARNERS WITH A RICH RANGE OF LEARNING EXPERIENCES IN THE DIGITAL AND PHYSICAL WORLD HELPS THEM DEVELOP THE SKILLS, KNOWLEDGE AND ATTRIBUTES TO BE CONFIDENT AND COMPETENT IN THE WORLD OF LEARNING, LIFE AND WORK.”

SARAH BURTON, DEPUTY HEAD TEACHER, MID CALDER PRIMARY SCHOOL

“WE KNOW THE GENDER IMBALANCE STARTS EARLY AND THE DIGITAL TECHNOLOGIES AND SKILLS GROUP IS WORKING WITH PARTNERS ACROSS SCOTLAND TO IMPLEMENT A JOINT ACTION PLAN TO ATTRACT FEMALES INTO THE SECTOR.”

EVELYN WALKER, CHAIR, DIGITAL TECHNOLOGIES SKILLS GROUP GENDER WORK STREAM, UK AND IRELAND PROJECT MANAGEMENT LEAD, HEWLETT PACKARD ENTERPRISE)

We will deliver a long-term structural plan to transform and enrich our education system. Building on our Digital Learning and Teaching Strategy⁹ and our wider work to promote STEM (Science, Technology Engineering & Maths),¹⁰ we will work with partners to capitalise on the benefits and opportunities of new technology to widen access to learning through projects like the E-Sgoil being taken forward in the Western Isles. We will focus our efforts on building digital literacy and confidence from the early years onwards, equipping our children and young people with the increasingly sophisticated and creative digital skills they need to thrive in modern society and the workplace.

Alongside this, we will forge a partnership between the public sector, business, universities and charities to tackle current shortages in digital skills across all sectors. This requires us to better match college and university provision with industry needs, work with employers to promote lifelong learning and increase opportunities for training and retraining, and do all we can to make digital careers more attractive to all groups in society. **The Scottish Government will take a**

⁹ <http://www.gov.scot/Publications/2016/09/9494>

¹⁰ <https://consult.scotland.gov.uk/stem/a-stem-education-and-training-strategy/>



high-profile, leadership role in tackling the gender gap that continues to persist in terms of digital skills and digital careers. Women still account for only 18% of digital technology roles across Scotland, compared to 39% working in other skilled occupations.¹¹ The percentage of girls and women pursuing qualifications in computing science or related qualifications at National 5, Higher and in college/universities is similarly low, ranging from 17-20%.¹² This gender gap is unacceptable and demands a long-term commitment, starting with action in our schools to encourage and inspire girls to study STEM subjects.

We will work with stakeholders to build and promote a robust case for inclusion that centres on the benefits that a more diverse workforce will bring in terms of innovation, service improvement and commercial success. We will also support further research to assess the under-representation of other groups within the digital sector and identify the reasons for this and the best mechanisms for overcoming it.

¹¹ Research by Napier University on behalf of the Scottish Government

¹² Ibid.

ACTIONS

ACTIONS TO BUILD A DIGITALLY-SKILLED NATION:

- > Update expectations for Digital Literacy and Computing Science in the school curriculum from Spring 2017, with appropriate support for teachers
 - > Provide coordinated support for extra-curricular activities such as coding clubs
 - > Launch a new Digital Schools programme, using regional and national pathfinders to test innovative approaches and transform digital skills development in Secondary schools
 - > Embed appropriate technology in the class room, using this to enrich learning across all subjects
 - > Take opportunities to use technology to widen access to learning through projects like the E-Sgoil being taken forward in the Western Isles
 - > Work with Computing Science teachers in secondary schools to establish priorities and options for professional development
 - > Provide opportunities through the forthcoming STEM Strategy to inspire young people to pursue these subjects
 - > Boost teacher numbers in computing and STEM subjects
- by introducing innovative pathways into the profession and a new marketing campaign
- > Work with the Scottish Funding Council, employers, colleges and universities to deliver courses and qualifications which are more responsive to the needs of business
 - > Build on our successful Modern Apprenticeships in digital technology frameworks, and support the roll out of the Foundation Apprenticeships in Software and Hardware, and Cyber Security
 - > Continue to roll out the new IT Management for Business and IT Software Graduate Level Apprenticeships to individuals and employers, which six universities are running from January 2017
 - > Build on the CodeClan model to improve the availability of high quality transition and workplace training
 - > Build the understanding of cyber security into every level of our broader skills agenda, starting with the promotion of basic digital skills and internet safety in schools

ACTIONS

ACTIONS TO PROMOTE DIVERSITY IN DIGITAL:

- > Share best practice and effective strategies to encourage more gender balance in computing science and other STEM subjects in schools, as part of Scotland's forthcoming STEM strategy
- > Work with our schools, employers and skills providers to raise awareness amongst women of the opportunities that digital knowledge and qualifications can unlock
- > Build a network of Scottish employers in all sectors that will listen to the challenges facing women in developing digital careers and take positive action to promote equality
- > Remove barriers to under-represented groups progressing into and within our digital professions across the public and private sectors
- > Require central government bodies to gather and publish digital workforce diversity data annually
- > Require unconscious bias training for all involved in recruiting, training or managing digital specialists in central government bodies
- > Establish a Digital Workforce Diversity Champions network for Scotland, providing training, support and networking opportunities
- > Promote digital role models from diverse backgrounds across the workplace and in our communities
- > Improve retention of women working in STEM jobs (as many as 70% of women with STEM qualifications are working in non-STEM-related industries. (Source: UK Women in STEM Pay Gap 2016)

“I WANT EVERYBODY TO BE SECURE, INCLUDED AND CONFIDENT IN THE DIGITAL SOCIETY THAT SCOTLAND WILL BECOME.”

FIONA HYSLOP, CABINET SECRETARY CULTURE, TOURISM AND EXTERNAL AFFAIRS



82% OF ADULTS USE THE INTERNET FOR PERSONAL USE.



81% OF ADULTS HAVE BASIC DIGITAL LITERACY.



A THIRD OF CITIZENS OVER 75 USE THE INTERNET.



ALMOST 3/4 OF ADULTS IN THE MOST DEPRIVED AREAS USE THE INTERNET FOR PERSONAL USE, COMPARED TO AROUND 90% IN THE LEAST DEPRIVED.

Digital Scotland:

- > Enables everybody to share in the social, economic and democratic opportunities of digital
- > Creates the conditions which safeguards workers and enables society to address concerns about the digital world

The changes that technology brings to our society are every bit as significant as the changes that it brings to our economy. Digital allows information to be transmitted faster and further than ever before, enabling us to develop new communities of interest and opening up new opportunities for education, commerce, creativity, friendship and leisure. In doing so however, it raises new challenges around security, information literacy and privacy. Whilst digital puts greater power in the hands of consumers and offers unprecedented access to decision makers, we have also seen doubts raised around the world about the impact that weighted or false information can have on democratic processes.

Scotland's Labour Market Strategy¹³

published in August 2016 acknowledged the impact that technological advances in manufacturing, automation and robotics will have on the labour market,¹⁴ the workplace and on workers. Again, there may be positives as repetitive tasks are automated or digitisation supports home working and has a positive impact on our work-life balance. However, there are also potential negatives with new forms of employment putting pressure on wages and mobile technology making it difficult for workers to “switch off” when they are at home.

“WE WANT TO INSPIRE OUR YOUNG PEOPLE TO BE CURIOUS, CREATIVE AND PASSIONATE ABOUT TECHNOLOGY.”

DAVID SIBBALD, CHAIR OF THE GLASGOW SCIENCE CENTRE BOARD

Our starting point is an absolute commitment to protecting the privacy rights of individuals. People want to know that public authorities and other organisations respect their privacy and recognise the harm which may be done if personal information is collected or held unnecessarily, or is lost or misused. We also recognise however that doubts and suspicions remain about the downside of digital. We believe that we have a duty to acknowledge both these concerns and reflect them in the way in which we encourage debate, develop legislation and help people to access information and services. **We will only create and sustain a society that is at ease with itself in the digital world if we are open and transparent** and not only comply with data protection and human rights legislation,¹⁵ but look outwards and ensure that such legislation keeps pace with changes in digital technology.

¹³ <http://www.gov.scot/Resource/0050/00504798.pdf>

¹⁴ http://www.oecd-ilibrary.org/social-issues-migration-health/the-risk-of-automation-for-jobs-in-oecd-countries_5jlz9h56dvq7-en

¹⁵ <http://www.gov.scot/Publications/2015/11/2023>

The very groups most likely to gain disproportionately from the benefits of being on line through financial savings, reduced isolation and access to employment opportunities are those most likely to be excluded. 99% of households in the highest income groups now enjoy access to the internet, but it is far less widespread amongst the elderly, the disabled, those living in social housing and people on low incomes.

“THE HOUSING SECTOR CAN PLAY ITS PART IN THE DIGITAL REVOLUTION, DEVELOPING AND CREATING NEW SERVICES FIT FOR THE DIGITAL AGE.”

MARTIN POLLHAMMER, CHIEF EXECUTIVE, EAST LOTHIAN HOUSING ASSOCIATION

The Scottish Government reaffirms its determination to play a central role in a [national movement for change to promote digital participation](#). Our aim is to ensure that everybody has the opportunity to participate in the digital world and to use the power of the internet to enable social mobility and tackle persistent inequalities. This starts with the basic digital skills that are required to search or buy goods and services online, use social networks and have an understanding of how to act in a safe and secure way. But it must go beyond that. People are at different points of their digital journey and many feel uncomfortable about the level of change that they see going on around them. We will therefore support the further expansion of the Digital Participation Charter and provide funds for community groups that enjoy the trust of those who are excluded from the digital world and can create both the reasons and deliver the training required to help people to go online for the first time. We will also ensure that as we roll new forms of connectivity out across the country, we work with housing associations, third sector organisations and other community groups to prototype affordable internet access at home and in other trusted settings.



ACTIONS

ACTIONS TO SUPPORT PEOPLE AND COMMUNITIES THROUGH SOCIAL CHANGES:

- > Ensure that the findings of the Youth Commission into digital rights supported by Young Scot are discussed at the highest levels of government and form the basis of a wider public debate on rights in a digital age
- > Use the Year of Young People 2018 as a platform to establish a clear commitment to digital rights and responsibilities that empower people to access the digital world creatively, knowledgeably and fearlessly
- > Ensure digital rights and responsibilities are embedded in skills frameworks and formal qualifications by working with Education Scotland, Skills Development Scotland and the Scottish Qualifications Authority in addition to community and third sector organisations
- > Review how automation and digitisation will impact on the future of work, including its impact on wages, rights, access to social protection and training opportunities by working with the Fair Work Convention, the new Strategic Labour Market Group and other partners
- > Support and safeguard the interest of workers and ensure fair digital work by working with Scotland's trade unions and others
- > Work with industry and our public agencies, through the high-level Tourism Working Group, to maximise digital opportunities for the visitor economy
- > Ensure the potential opportunities and implications of the latest technological developments are understood and harnessed by working with the Scottish Government's science advisory system

ACTIONS

ACTIONS TO PROMOTE DIGITAL INCLUSION AND PARTICIPATION:

- > Launch a new round of funding for community digital inclusion projects providing practical, hands on support for digital training throughout Scotland
- > Expand the Digital Participation Charter, getting more organisations committed to training their staff in basic digital skills and contributing to community inclusion initiatives
- > Review our approach to promoting the benefits of being online to increase participation levels
- > Form a Ministerial Action Group which will draw on a broad range of expertise across all sectors and interests. It will take an evidence-based approach to addressing digital exclusion amongst all age groups
- > Close the opportunity gap by working with housing associations, third sector organisations and other community groups to prototype affordable internet access at home and in other trusted settings

“I WANT TO LIVE IN A CYBER-RESILIENT SCOTLAND, BECAUSE THIS IS A SCOTLAND THAT IS SAFE, SECURE AND PROSPEROUS.”

JOHN SWINNEY, DEPUTY FIRST MINISTER AND CABINET SECRETARY FOR EDUCATION AND SKILLS



92% OF ADULTS WHO USE THE INTERNET TAKE SOME FORM OF ONLINE SECURITY MEASURES.



66% OF INTERNET USERS AVOID OPENING EMAILS OR ATTACHMENTS FROM UNKNOWN PEOPLE.



51% OF INTERNET USERS SET COMPLEX PASSWORDS.



76% OF INTERNET USERS WERE CONFIDENT CONTROLLING PRIVACY SETTINGS ONLINE.

Digital Scotland:

> Aspires to be recognised as a world leader in cyber resilience

Our ambition is to make Scotland a world leader in cyber resilience, with a global reputation for being a secure place to work, learn and do business.¹⁶ Getting the security right is a fundamental enabling factor in our digital future. As we carry out more transactions and share more information online the greater the risk of our information, operations and finances being stolen, exploited or disrupted. These risks will only increase as we build and benefit from the internet of things innovation. Our global reputation for cyber resilience has the potential to quickly become a determinant of future economic success.

“SCOTTISH COMPANIES ARE AT THE HEART OF THE DIGITAL REVOLUTION. BUSINESSES THAT ARE CYBER RESILIENT STAND TO GAIN COMPETITIVE ADVANTAGE.”

HUGH AITKEN CBE, CHIEF EXECUTIVE, CBI SCOTLAND AND CHAIR OF NATIONAL CYBER RESILIENCE LEADER’S BOARD

We will deliver a step-change in the cyber resilience of our citizens, businesses, public services and government by ensuring:

- > People can access straightforward, reliable and easily accessible advice on cyber security
- > Organisations share information about cyber threats across sectors and are well prepared to manage them
- > Our digital public services are safe and secure to use
- > We have a global reputation for being a secure place to live and learn, and to set up and invest in business
- > Growth in our innovative cyber security, goods and services industry that can help meet global demand
- > Effective and coordinated cyber security research and innovation across Academia and Industry
- > Cyber resilience skills are embedded within our wider digital skills ambitions
- > Universities produce, and Scotland then retains, outstanding graduates in digital design, ethical-hacking and forensics
- > We identify and work with partners to prioritise those economic sectors where Scotland is most likely to be able to build its international reputation for excellence

Actions to ensure a safe and resilient digital country:

- > Assess and build upon current awareness raising communication activities
- > Establish a central gateway for trusted advice and guidance on cyber security and resilience for people and businesses in Scotland in partnership with the National Cyber Security Centre
- > Increase the digital and cyber resilience maturity of Scottish businesses of all sizes with Scottish Enterprise and business membership organisations playing a key role
- > Increase the number of apprenticeships in cyber resilience and promote cyber skills throughout the learning journey, including school and the workplace
- > Enhance collaborative research and disseminate effective practice by working with Scottish Universities
- > Ensure that our Critical National Infrastructure is secure and resilient against cyber attack by working with the National Cyber Security Centre
- > Ensure that security issues are built into the design of Digital Public Services and assessed, at each stage, as part of the Digital First Standard

¹⁶ <http://www.gov.scot/Publications/2015/11/2023>

ANNEX A

Measuring our progress

The measurement framework sets out how we will monitor progress towards achieving our vision of realising Scotland's full potential in a digital world. The framework establishes what success would look like and identifies accompanying high-level indicators to enable us to track performance.

| PURPOSE: To create a more successful country, with opportunities for all of Scotland to flourish, through increasing sustainable economic growth. | | | | | | | |
|---|--|---|--|--|--|---|---|
| Purpose Targets | Economic growth | Participation | Productivity | Population | Inclusion | Sustainability | Solidarity |
| VISION: | To realise Scotland's full potential in a digital world. | | | | | | |
| Outcomes | High quality connectivity across the whole of the country. | A digitally-skilled and inclusive workforce. | Internationally competitive, digitally mature businesses across all sectors of the economy. | Efficient, user-centric digital public services. | A digital society which enables everyone to share in the social, economic and democratic opportunities of digital. | Cyber resilience with a global reputation for being a secure place to work, learn and do business. | Non-personal data that is shared in a trustworthy manner to contribute to innovation and efficiency. |
| Measure(s) of success | 1. Availability of next generation broadband. | 1. Reduction in the digital skills gap. 2. An inclusive population skills profile. | 1. Digital maturity of Scottish businesses. 2. Digital performance of Scottish businesses. | 1. User satisfaction with digital public services. 2. Cost savings achieved through digital public services. | 1. Widening digital participation. | 1. Individuals and organisations are becoming increasingly resilient when using digital technologies. | 1. Citizens trust the public sector uses their personal information in a trustworthy manner. 2. Good quality, well-managed data is available for sharing. |
| Indicators | 1. Proportion of premises where next generation broadband access is available. | 1. Number of people employed in the digital sector and digital occupations. 2. Number and gender diversity of those pursuing digital-related qualifications. Diversity of those employed within the digital sector. | 1. Digital Maturity Index. 2. Digital sector gross value added (GVA). Value of online trade conducted by Scottish businesses.* | 1. Percentage of adults satisfied with overall quality of online public services. 2. Savings achieved from collaborative procurement of ICT services. | 1. Percentage of adults using the internet by demographic group. Confidence in pursuing online activities. | 1. Percentage of adults demonstrating cyber-resilient behaviours. Number of organisations in Scotland with cyber essentials or other cyber security certification. | 1. Percentage of people who trust public services to handle their data appropriately. 2. Number of datasets which are available for research in the public interest and average time taken to access these datasets. |

* We will investigate the possibility of measuring the value of online trade for Scottish businesses in early 2017.



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