spreading the benefits of digital participation

An interim report for consultation
<table>
<thead>
<tr>
<th>Contents</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Executive Summary</td>
<td>5</td>
</tr>
<tr>
<td>Introduction</td>
<td>14</td>
</tr>
<tr>
<td>This Inquiry</td>
<td>16</td>
</tr>
<tr>
<td>1. Digital Scotland</td>
<td></td>
</tr>
<tr>
<td>1.1. Scotland’s Digital Ambition</td>
<td>17</td>
</tr>
<tr>
<td>1.2. Infrastructure</td>
<td>18</td>
</tr>
<tr>
<td>1.3. Beyond Infrastructure</td>
<td>22</td>
</tr>
<tr>
<td>1.4. Building a Digital Society</td>
<td>27</td>
</tr>
<tr>
<td>2. Digital Dividend</td>
<td></td>
</tr>
<tr>
<td>2.1. Education and Training</td>
<td>29</td>
</tr>
<tr>
<td>2.2. Health</td>
<td>30</td>
</tr>
<tr>
<td>2.3. Social and Cultural</td>
<td>30</td>
</tr>
<tr>
<td>2.4 Economic</td>
<td>33</td>
</tr>
<tr>
<td>3. Digital Divide</td>
<td></td>
</tr>
<tr>
<td>3.1. Access</td>
<td>37</td>
</tr>
<tr>
<td>3.2. Motivation</td>
<td>39</td>
</tr>
<tr>
<td>3.3. Skills</td>
<td>44</td>
</tr>
<tr>
<td>4. Digital Inclusion</td>
<td></td>
</tr>
<tr>
<td>4.1. Access</td>
<td>47</td>
</tr>
<tr>
<td>4.2. Motivation</td>
<td>53</td>
</tr>
<tr>
<td>4.3. Skills</td>
<td>55</td>
</tr>
<tr>
<td>Appendix A</td>
<td>61</td>
</tr>
<tr>
<td>Appendix B</td>
<td>62</td>
</tr>
<tr>
<td>Appendix C</td>
<td>63</td>
</tr>
<tr>
<td>Glossary</td>
<td>64</td>
</tr>
</tbody>
</table>
Digital Scotland: Spreading the Benefits
An Interim Report for consultation

In 2009, the UK Government published its report *Digital Britain*, which set out an ambition, “to secure the UK’s position as one of the world’s leading digital knowledge economies.” Building on this, the Royal Society of Edinburgh (RSE) set up a working group to take a broader view of the ways in which technological change could be stimulated and exploited for economic and social benefit, and to explore these within the economic, social and geographic context of Scotland. The report’s intention was to stimulate debate, to identify priorities, to suggest the roles that governmental and non-governmental organisations might play in exploiting the digital world, and to recommend some strategic priorities for Scotland.

We published an interim report in June 2010, and our final report, Digital Scotland¹, in October of that year. These reports focused on the need for robust digital infrastructure across Scotland and how this might best be delivered by the Scottish Government in partnership with the UK Government and local councils.

Recognising that the provision of infrastructure alone will not ensure that Scotland reaps the benefits of the digital revolution, and that it will be necessary to overcome many barriers to participation and digital engagement, in 2012 the RSE convened a multidisciplinary committee to investigate how best to maximise the societal benefit of a Digital Scotland.

Bringing together expertise from informatics, public sector management, social media, social science, education and the voluntary sector, the Inquiry set out to:

> understand the potential societal benefits of digital technologies and how these might be realised;
> highlight the social and economic risks of a growing digital divide;
> identify the barriers preventing digital participation; and
> identify policies and actions that would overcome these barriers and maximise the benefits of a Digital Scotland to all.

In this, our Interim Report, we call on the Scottish Government to recognise that every individual has an undeniable right to digital inclusion. The body of the report concentrates on vital issues that need urgently to be addressed by the Scottish, UK and local governments, in partnership with the private and third sectors, to ensure that everyone in Scotland can share in the benefits of the new digital world. Its purpose is to invite feedback and comment both from those who have already provided evidence and from others who have an interest in the development of Digital Scotland.

Our final report will be published early in 2014. We ask that all feedback is provided by 8 February 2014. This can be sent by email to digiscot@royalsoced.org.uk or in writing to The Digital Inquiry Committee, The Royal Society of Edinburgh, 22 George Street, Edinburgh, EH2 2PQ.

This is work in progress. We intend that our final report will evolve considerably, particularly in elaborating recommendations that address the key challenges. We can best do this if we receive comments and suggestions from a wide range of stakeholders. We therefore ask you to consider this draft and suggest ways in which it should be amended, by commenting on our interim recommendations and on how the key challenges might be addressed, and by identifying opportunities and obstacles we have missed.

Michael Fourman, FRSE, FBCS
Alan Alexander, OBE, FRSE
Co-chairs, RSE Digital Scotland Working Group

Executive Summary

- The Scottish Government must recognise that every individual has an undeniable right to digital inclusion and should assume overall accountability for ensuring that it is available, and accessible to all.
  
The digital revolution brings new opportunities for education and health, and for economic and social wellbeing. However, those who remain offline will be denied access to many goods and services. They will be increasingly excluded from society and the economy.

- The Scottish Government must eradicate digital exclusion in Scotland.
  
  Digital exclusion in Scotland is strongly linked to deprivation. Where there is deprivation – in employment and income, in education and health, in housing and geography – there is low broadband uptake. The Scottish Government should adopt an appropriate definition of digital poverty, so that it can monitor and eradicate this digital exclusion.

- Scotland has set its ambitions too low.
  
  Scotland should draw on the examples of Iceland, Sweden and Norway, where, despite rugged geographies and low population densities, broadband connectivity and use are above 90%. Some parts of Scotland already come close to these levels: why not achieve them for all?

In this report we address three factors that govern digital participation: access, motivation and skills.

Access

Geography is undoubtedly a barrier to broadband access for some, particularly in remote regions. However, the cost of a broadband connection is the major obstacle for most of those who remain offline.

Some households will remain offline, whether by choice or circumstance. For people who do not have a permanent address, signing up for a fixed broadband contract may not be a realistic option. There should be other opportunities for digital participation for the homeless and for people with no internet access at home.

We need much more public access, with sufficient privacy for people to undertake confidential transactions online. We also need public access to the internet in social spaces that provide opportunities for peer learning. Scotland should extend public access to public assets to provide such opportunities.

Scotland should also explore other ways to provide affordable digital access, including local networks for communities and in social housing.

Motivation

We must stimulate digital participation at the community level.

People will be more motivated to participate digitally if other members of their community are online, be they geographic communities, communities of interest, or business communities. This ‘network effect’ is important in motivating digital participation. Individuals, businesses and third-sector organisations should all be included. The loan of devices and equipment may be required to get communities interested and engaged with the online world, and establish the network effect.

The consumer benefits of digital participation – such as on-demand TV or social networks – may have brought many others online, but they have clearly been insufficient to motivate those who remain offline. This ‘long-tail’ of digital sceptics will include people with diverse, niche interests that mainstream marketing does not address. Efforts based on local communities of interest should identify activities that will motivate these people to go online.

Many of Scotland’s more than 113,000 small and micro businesses are not online or are not making effective use of digital tools. They also need motivation to take the first steps towards digital participation. Enterprise organisations should assist Scottish businesses in identifying basic opportunities for online exposure and should provide guidance in the use of free online tools, for example diaries, blogs and local business listings.
Executive Summary

Skills
Scotland has a shortage of digital skills. Digital literacy is a prerequisite for inclusion in a digital society. Over a million adults in Scotland lack basic digital skills.

A digital society also needs the technical skills and scientific understanding it takes to create digital tools and content, and to use them effectively in all walks of life.

The Scottish Government must ensure that the Scottish education system – pre-school, primary, secondary and tertiary – is equipped and able to provide the education and training in digital literacy, software and systems technology, informatics and computer science, required by a digital society.

It is also important to provide opportunities for peer-to-peer learning, along with the online tools and resources that will allow individuals and businesses to develop their digital skills after they have taken their first steps online.

There are many excellent examples of local initiatives across Scotland to stimulate digital inclusion and develop digital skills, but far too few to match the scale of the problem. The Scottish Government should stimulate local initiatives by providing advice, support and resources that can most effectively be developed and refined at national scale.

Beyond improving access, generating motivation, and developing skills – the main themes of this interim review – Scotland must also address wider societal issues in building a digital society. Such issues include privacy, identity, safety and regulation. We will explore these areas further and intend to address them in our final report. We welcome evidence and comments on such wider issues, as well as those addressed herein.

We now list our major conclusions and recommendations. These are underpinned by the evidence given in the body of this report.

Conclusions and Recommendations

A digital society must embrace new responsibilities:

- to ensure that everyone has affordable access to a robust digital infrastructure;
- to educate citizens in the productive, responsible and critical use of digital technologies; and
- to protect citizens from abuse of these technologies, whether by third parties or by organs of the state.

Addressing these responsibilities is a necessary foundation for a Digital Scotland.

The overriding conclusion of this Inquiry underpins the urgency of this task.

Conclusion:
The digital revolution will continue to provide new opportunities for education, health and economic and social wellbeing to those who are online. Offline access to many goods and services will become increasingly rare and expensive. Any who remain offline will be increasingly excluded from society and the economy.

Recommendation 1:
The Scottish Government must recognise that every individual has an undeniable right to digital inclusion and should assume overall accountability for ensuring it is available, and accessible to all.

The remaining recommendations of this Interim Report set out the first steps to a Digital Scotland. They address three key areas: access, motivation and skills. Access, necessarily, comes first; but it is also essential to ensure that everyone who can access the internet is aware of, and able to reap, the benefits.
Conclusions and Recommendations

Access
Availability

**Conclusion:**
Continuing progress in technologies threatens to widen the digital divide. As most people find new ways of exploiting ever-improving technologies, others must keep pace, or be left behind.

**Recommendation 2:**
The Scottish Government must adopt an appropriate definition of *digital poverty* by which to measure and eradicate digital exclusion in Scotland.

- *Digital poverty* should be defined relative to the quality of services available to most.
- This definition should be used by the Scottish Government in ongoing assessment and reporting on digital poverty in Scotland, alongside other measures of deprivation.
- The Scottish Government must commit to eradicating digital poverty in Scotland.

**Recommendation 3:**
All public buildings and new builds must be equipped to provide a broadband internet connection.

- The Scottish Government must make the installation of ducting suitable for fibre a planning requirement of all public works and new build, as recommended in the Digital Scotland report (2010).

**Conclusion:**
A significant proportion of Scotland’s population will still not have internet access in the home by 2020. Increased open public access to the internet, that accommodates both social and private uses, must be made available.

**Recommendation 4:**
Local Authorities must permit and facilitate wider public access to local public assets:

- IT suites and wifi connections in schools, colleges and universities, which currently lie idle for many hours each day, should be opened up for public access by the local community at designated times.
- Existing public access should be increased; for example, by extending library opening times and increasing available access to computers and wifi in and around public buildings.
Conclusions and Recommendations

Cost and Affordability

**Conclusion:**
The most deprived areas across Scotland have the lowest levels of internet access. Cost is a barrier for many. Only people with either a credit card or a bank account can subscribe to standard contracts for fixed broadband services. In both urban and rural areas, local community networks can provide internet access by effectively sharing the cost of one or more high-speed connections between a community of users. The development of such networks is often impeded by the lack of affordable access to backhaul.

**Recommendation 5:**
The Scottish Government must commit to ensuring open access to broadband networks for use by communities, housing associations and other providers, so that affordable internet access is a possibility for all.

- The Scottish and UK Governments must ensure, if necessary by legislation enforced by regulation, that wholesale access to Scotland’s core internet infrastructure is open to communities, housing associations and other providers.
- Social housing providers should develop and share new architectures and business models for the provision of affordable internet access across housing estates and tower blocks. The Wheatley Group has taken this approach in a recent pilot project in Glasgow Housing Association properties. Lessons learned from this project should inform the design of initiatives that can be rolled out at scale.

Motivation

Spreading positive motivators

**Conclusion:**
There is wide variation in digital uptake and inclusion at local level. In some communities, local businesses and service providers see no reason to go online because their customers are not online; while some individuals see no reason to go online because none of their friends is online – a vicious circle. Programmes that provide access, devices and learning opportunities to small groups have proven more effective than individual interventions.

**Recommendation 6:**
The importance of the network effect in building a critical mass of participation within a community must be recognised.

- Governments at all levels should ensure that subsidies are available to provide connectivity and loans of equipment to bring communities online.
- Enterprise agencies should provide similar support to local small businesses.
Conclusions and Recommendations

**Conclusion:**
Individual motivations for going online are social and cultural. Service providers have effectively targeted mass interests, such as sport and movies, to stimulate demand. Those not online include a ‘long tail’ of individuals with diverse minority interests.

**Conclusion:**
While motivations are personal, the skills required to navigate the online world confidently and safely are generic. Once people have taken the first steps to go online, they can be supported online to develop these skills. Good online tools have been developed, tested and refined, in the UK and elsewhere, by charities, trusts and companies, including the Tinder Foundation, Google and others.

**Conclusion:**
Many initiatives are being implemented in Scotland, particularly by the third sector, to assist people in acquiring skills in the use of digital technology. However, these efforts do not yet match the scale of the problem. Furthermore, there is no coordinated support for these services, and no efficient mechanisms for learning from the mistakes of others and sharing best practice.

**Conclusion:**
Where individuals have the opportunity to be online in social situations, peer-to-peer learning and intergenerational learning are effective in spreading both motivation and skills.

**Conclusion:**
Support aimed at encouraging individuals and organisations to go online should be delivered by existing organisations at community level to ensure that digital tools can be used to enhance communities, be they geographic communities, communities of interest, or professional communities.

**Recommendation 7:**
The Scottish Government should ensure that local efforts to address digital exclusion have national support.

- The Scottish Government should ensure that local groups addressing digital exclusion at community levels have access to appropriate resources and support networks that enable them to share and refine best practice.
- The Scottish Government should provide funding where needed, for the creation and support of local centres addressing issues of digital exclusion.

**Conclusion:**
Initial experiences of the internet need to be positive. The public sector must provide coherent, navigable and usable websites and digital interfaces, accessible to all on a wide range of devices.
Conclusions and Recommendations

**Recommendation 8:**
The Scottish Government, local public service providers and third sector organisations should ensure the usability and accessibility of public sector websites, monitor user experience and collect and respond to user-feedback.

- The Scottish Government should consult with third sector organisations and users, to understand and respond to the needs of those who have accessibility issues or limited digital skills.
- All public sector organisations in Scotland should commit to meeting these needs.

**Overcoming negative motivators**

**Conclusion:**
Many people choose not to go online because they are concerned about privacy and security of personal data; others are afraid of bullying or ridicule.

**Conclusion:**
Educational messages around the internet, particularly around safety online, need to reflect more nuanced approaches to risk management, guiding citizens on risks, proportionate responses to risks and approaches that promote safety and security.

**Recommendation 9:**
The Scottish Government should ensure that individuals have access to proportionate opportunities for redress from companies and individuals who abuse the internet.

**Skills**

**Individuals**

**Conclusion:**
A digital society requires a range of digital skills going beyond universal digital literacy. While the Scottish Qualifications Authority (SQA) is to be supported in its ongoing curriculum development in software and systems technology, Scotland’s education systems, like those elsewhere, do not yet meet the needs of a digital society.
Conclusions and Recommendations

Recommendation 10:
The Scottish Government must ensure that the Scottish education system – pre-school, primary, secondary and tertiary – is equipped and able to provide education and training in digital literacy, software and systems technology, informatics and computer science. All are required by a digital society.

- Digital literacy should be as much of a critical overarching element of the national curriculum as are literacy and numeracy. Therefore, teachers of all subjects should be both using digital technology and developing the digital skills of their students during their teaching.
- Scotland should have clearly defined outcomes for computer science, taught as a science on a par with other science subjects, both within broad general education and in the senior phase qualification courses. The Scottish Government should revisit this subject, in consultation with employers and universities, to ensure that the Scottish education system provides for the needs of a digital society.

Conclusion:
All teachers must have basic digital skills if they are to demonstrate and teach these within their classes. The Scottish Government has recently provided funding for a programme of professional learning for Scotland’s computing teachers. This is a positive step but it does not address the lack of digital skills and confidence amongst other teaching staff.

Recommendation 11:
The Scottish Government should ensure that Scottish primary and secondary teachers are able to demonstrate appropriate digital skills within their classes. Refresher courses in digital literacy and computer skills appropriate to the level and subject of instruction should be made available for all teachers who are not confident using the internet or computers in their classes. The recent introduction of ‘The Standard for Career-Long Professional Learning: supporting the development of teacher professional learning’ by the General Teaching Council of Scotland, is a potential mechanism to support this recommendation.

Recommendation 12:
There should be specific provision to address the needs of adult learners who have never had the opportunity to develop digital literacy. This is an urgent prerequisite for digital inclusion.

- Providers of lifelong and community education should similarly ensure that they are equipped and skilled to support students in developing digital literacy and computer skills appropriate to the focus of study.

Conclusion:
Many initiatives are being implemented in Scotland, particularly by the third sector, to assist people in acquiring skills in the use of digital technology. However, these efforts do not match the scale of the problem. Furthermore, there is no coordinated support for these services, and no efficient mechanisms for learning from the mistakes of others and sharing best practice.
Conclusions and Recommendations

Recommendation 13:
Public and third sector initiatives providing online skills training should be coordinated under an overarching digital skills initiative.

- The Scottish Government should provide a Scotland-wide registry of available training and support services for individuals, which can be used by public and voluntary sector support providers for referring individuals on to appropriate support.
- The Scottish Government should provide funding to allow local support groups and services to access and share resources and support.

Organisations

Conclusion:
Most small and medium enterprises, across the UK, are not making effective use of digital tools. Many micro enterprises (with fewer than ten employees) in Scotland see no reason to go online, and most of those who are online have no access to reliable and impartial advice. Many could benefit from the use of various free online services but local providers have no incentive to lead them to these. An online presence today is as important as a telephone directory listing once was.

Recommendation 14:
Enterprise agencies must develop simple checklists of free online services and tools – such as business listings, appointments diaries, blogs and calendars – and use these to help businesses to engage with the online world.

Recommendation 15:
Enterprise organisations should establish and support regular local ‘MeetUps’ for SMEs, where they can explore potential benefits of digital engagement, share skills and knowledge, and where local service providers can meet with potential clients and establish their trust.

Conclusion:
Much current support from enterprise agencies is directed at businesses that are already online.

Recommendation 16:
Enterprise organisations should provide well targeted and well packaged initiatives aimed at providing support for SMEs to make the small, entry-level steps necessary to establish a web presence and other basic digital skills. Advice on costs and suitability of different web packages and digital media should be an integral part of such initiatives.
Conclusions and Recommendations

**Conclusion:**
There are over 100,000 small business addresses in Scotland. Most of these will require some help developing digital skills.

**Recommendation 17:**
Enterprise organisations and support agencies must rely primarily on peer-to-peer learning and supported online learning to match the scale of the problem. National intervention should focus on providing appropriate online materials and support mechanisms that allow these to be refined and adapted in response to feedback from users.

**Conclusion:**
Motivating small business owners and staff to dedicate limited human and economic resource into developing and maintaining digital skills and capabilities is a major challenge. Digital skills training packages must be clearly linked to sustainable business models and opportunities for growth, if SMEs are to be convinced that it is worth devoting time and resources to upskilling their employees.

**Conclusion:**
Most offline businesses do not have the skills required to specify requirements and evaluate providers of digital services.

**Recommendation 18:**
Enterprise organisations must provide skills training for businesses to specify requirements and evaluate providers of digital services.

- Enterprise organisations in Scotland should establish initiatives for the recognition of skilled and reputable web developers, in order to support SMEs in identifying reliable and digitally-skilled providers.

- As part of the support given to SMEs, enterprise organisations should provide guidelines on writing appropriate specifications for digital contracts; for example, template briefs, example bids, etc. Many web developers and IT companies are themselves SMEs and, in order to price and produce appropriate work, they must be assured that customers are able to articulate their needs adequately.


**Introduction**

Digital technologies provide new ways to collect, process, communicate and analyse information, and information is the lifeblood of society. The Special Rapporteur to the Human Rights Council of the United Nations has recognised “the unique and transformative nature of the Internet, not only to enable individuals to exercise their right to freedom of opinion and expression, but also a range of other human rights, and to promote the progress of society as a whole.”

These technologies can make government at both the local and national level more effective and more democratic. They can reduce the costs and extend the reach of services – education, health and personal public services are the most obvious examples. Digital technologies can make businesses more efficient, more innovative and the economy more competitive. Digital technologies can also offer opportunities for people to explore interests, share and access knowledge and keep in touch with family and friends. They enable the creation of new forms of community and can reduce social isolation for individuals in marginalised groups.

In our first Digital Scotland Inquiry (2010) we focused on infrastructure. Our report identified a key barrier to increased digital participation in Scotland: the gap between the median internet connection speed, enjoyed by most, and the minimum speed available to all. The recommendations of that report concentrated on how to achieve universal access to adequate infrastructure. However, removing the infrastructure barrier, though critical, is only a first step on the road to digital inclusion.

Infrastructure is not enough. How should a Digital Scotland use the infrastructure to maximise social benefits, and ensure that these benefits are shared across society, serving to narrow, rather than widen, social and economic divisions?

To maximise the benefits, we must ensure that all public, private and third-sector organisations in Scotland have unfettered access to the infrastructure, tools and skills they need to make effective use of digital technologies. To spread the benefits to all, and to avoid a growing digital divide, everyone must also have the motivation and skills needed to access and use digital technologies confidently, productively and safely.

As organisations increasingly operate online, individuals and organisations that remain offline are excluded from their services. Increasingly, there are no offline channels for enquiries, complaints, orders or job applications. At the same time, ‘paper free’ and internet-only tariffs and accounts exclude those without effective access to the internet. Until everyone is online, a growing digital divide increasingly serves to exacerbate existing deprivation.

Companies can choose their customers: it is often more profitable to deal only with those who can deal online. Public services, and most third-sector organisations, are different. They must be accessible to all. Until everyone ‘goes digital’, these organisations cannot move services completely online and realise the full efficiencies of digital working.

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3 Booz and Co. 2012, *This is for everyone: the case for universal digitisation* (p7), [www.booz.com/media/uploads/BoozCo_This-Is-for-Everyone.pdf](http://www.booz.com/media/uploads/BoozCo_This-Is-for-Everyone.pdf)

Scotland leads the world in several areas of digital technology. Alongside this, Scotland has a thriving digital economy. Those who are online make more use of digital technologies than those online in other parts of the UK. However, many people have never been online, while at an organisational level, not all public services, small businesses and third-sector organisations in Scotland make effective use of digital technologies.

In 2012, parts of the central belt of Scotland enjoyed some of the highest average internet speeds in the UK. However, even where such infrastructure exists, Scotland still has disproportionately low levels of digital participation. Many individuals in the most deprived sectors of our society, people who may be isolated, living in poverty, elderly or ill, cannot share in the benefits of a Digital Scotland.

While cost and availability still deprive some people of access to digital services, many individuals who remain offline have no wish to change. Some people do not recognise the benefits of ‘going digital’, some fear abuse, cybercrime and surveillance. Must everyone go online? A digital society must address these issues.

We conclude that digital literacy, in this digital age, is now as important as literacy and numeracy. Those without digital skills will be increasingly excluded from opportunities that will be available only online, or only to those who are able to use digital technologies.

A digital society must embrace new responsibilities:

- to ensure that everyone has affordable access to a robust digital infrastructure;
- to educate citizens in the productive, responsible and critical use of digital technologies; and
- to protect citizens from abuse through these technologies, whether by third parties or by the state.

However, it must be recognised that there will always be a small number of people who cannot or will not participate in the digital world. Government also has a responsibility to ensure that these people continue to have equality of opportunity and that there are minimum penalties for those who are not online.

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5 Ofcom, 2013, Communications Market Report: Scotland
http://stakeholders.ofcom.org.uk/binaries/research/cmr/cmr13/2013_CMR_Scotland.pdf
This Inquiry

In 2012, the RSE established a multidisciplinary group to investigate how Scotland should maximise the benefit that the digital infrastructure brings to society, individuals and organisations. Bringing together expertise from informatics, public sector management, social media, social science, education and the voluntary sector, the Inquiry has set out to:

- understand the potential societal benefits of digital technologies and how Scotland might realise these;
- highlight the social and economic risks of a growing digital divide;
- identify the barriers preventing increased digital participation and engagement; and
- identify policies and actions that could overcome these barriers and maximise the benefits of a Digital Scotland.

We have reviewed evidence on the ‘digital dividend’ (the benefits that can be realised through the use of digital technologies) and on digital participation. This has included examining existing literature and hearing expert evidence from organisations such as the Tinder Foundation, The Carnegie UK Trust and Citizens Advice Scotland. We complemented this evidence in a series of consultation sessions through which we consulted over 250 individuals across Scotland, from Hawick in the Borders to Lerwick in Shetland. We have met with high-school children in Glasgow and North Berwick; with individuals and representatives from local communities in 12 Scottish towns and cities; and with representatives from a broad range of sectors, including Education, Health, local government, accessibilities, housing, third sector, creative industries and e-commerce. At our local-area consultations, we gathered feedback on local issues affecting public, private and third-sector bodies. We also invited responses to an online and a paper document on digital participation, and gathered written evidence from stakeholders and sector representatives, including BT and the Scottish Council for Voluntary Organisations (SCVO), amongst others. We have gathered significant amounts of quantitative evidence, and further analysis of this evidence will appear in our final report.

We now call on the Scottish Government to recognise that every individual has an undeniable right to digital inclusion, and report on our interim findings and recommendations in four sections:

- Digital Scotland: the current status;
- Digital Dividend: the potential benefits;
- Digital Divide: existing barriers;
- Digital Inclusion: spreading the benefits.
1 Digital Scotland

We begin by reviewing the status quo: Scotland’s Digital Ambition, current Government initiatives for Scotland’s Digital Future, and the current state of Scotland’s digital infrastructure and participation. We consider also the new responsibilities that Government must address when building a digital society.

1.1. Scotland’s digital ambition

Digital engagement is a matter of individual choice and circumstance. However, many of the benefits are felt collectively. So, just as for immunisation, where the ‘herd’ effect increases effectiveness, there is a common interest in extending participation. For this reason, there is a role for society, through its institutions – public, private and third sector – to enable and foster participation, first by ensuring the adequacy of the physical infrastructure, then by stimulating effective use of the internet by individuals and organisations.

In October 2010, the Scottish Government published A Digital Ambition for Scotland. It recognised that, “by harnessing advances in this area we can help:

1 Give our young people the best start in life and prepare them for success in a 21st Century marketplace;
2 Boost people’s job opportunities;
3 Ensure that Scottish businesses can benefit from a first-rate broadband infrastructure that allows them to thrive in markets both at home and abroad;
4 Showcase and promote our country’s rich cultural assets; and
5 Generate savings to the national purse by promoting the take-up of public services online.”

The strategy also set ambitious goals:

> That next generation broadband will be available to all by 2020 with an interim milestone to close the digital divide;
> That the rate of broadband uptake by people in Scotland should be at or above the UK average by 2013, and should be highest among the UK nations by 2015.

Scotland has already achieved a great deal, but continued low levels of digital participation suggest that we have not reached the 2013 goal and that we must do more.

The stated aim of both the UK Government and the Scottish Government is to eliminate the so-called ‘digital divide’ between those for whom digital participation has become an integral part of daily life and those who remain excluded. Although some of the funding comes from the UK Government, the development and implementation of strategies to address the digital divide is largely devolved.

In 2011, the Scottish Government published Scotland’s Digital Future and in early 2012 established a Directorate for Digital, working under the Director-General Enterprise, Environment & Digital. The Directorate set out to develop this strategy and to coordinate its implementation by “focusing on four key areas to achieve Scotland’s digital ambition: public service delivery; the digital economy; digital participation; and broadband connectivity”.

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8 Scottish Government, 2013, Directorates, http://www.scotland.gov.uk/About/People/Directorates
Digital Scotland

The goals set out in the strategy are laudable: world-class digital infrastructure; a public sector that makes best use of digital technologies to deliver high-quality services; a business sector in which all companies make effective use of digital technologies; and citizens who are confident and capable users of digital technologies. However, it is important to temper Scotland’s ambitions with a realistic assessment of the continuing digital divide. In particular, the most vulnerable and deprived sectors of society experience greatest digital exclusion. Until we address this exclusion, digital public services targeted at these customers are likely to yield neither savings nor benefits.

Until digital inclusion is universal, the public sector will not be able to realise the full efficiencies of moving its services online; many of Scotland’s businesses will struggle to compete; and people in Scotland who do not have the access, motivation or skills to participate in the digital society will face growing exclusion from an increasingly digital society.

Various initiatives aimed at increasing digital participation are underway in Scotland, often supported by mobile or fixed-line internet service providers. These initiatives include:

- initiatives by the two enterprise agencies, Scottish Enterprise and Highlands and Islands Enterprise;
- initiatives by local authorities;
- initiatives by voluntary organisations;
- initiatives by social housing providers, mainly housing associations.

We describe some of the best examples of these initiatives in the good practice/case study boxes elsewhere in the report.

However, while these initiatives are worthwhile and sometimes very well-conceived as ways of increasing digital participation, there is a lack of co-ordination among the agencies promoting them, and they do not match the scale of the problem. In particular, we were not convinced that the co-operation between the enterprise agencies and the local authorities in the areas they serve was close enough to maximise impact and to avoid duplication of effort. Nor were we convinced that the work of statutory bodies – local councils and enterprise agencies – was closely enough integrated with voluntary sector bodies, some of which are grant-aided by the statutory bodies.

Scotland continues to lag behind the UK as a whole in digital participation. Home broadband take up in Scotland stands at 70% compared to a UK average of 75%. Ten percent of Scotland’s population is thinly spread in remote rural and island communities. This presents a particular challenge to the market-driven roll-out of suitable infrastructure. Scotland also has pockets of multiple deprivation within many of its urban areas, including Glasgow City, Edinburgh City, West Lothian and Aberdeen City. These communities have particularly low rates of digital participation.

1.2. Infrastructure

The RSE’s Digital Scotland (2010) report highlighted inadequacies in Scotland’s existing digital infrastructure, and identified this as a barrier to access and participation. Government data showed that, although broadband speeds had increased over the previous decade, maps of the ‘access divide’ in Scotland produced in 2001 and 2012 (Figure 1) looked broadly identical. These maps show that private sector investment was focused on larger, accessible centres of population, leaving large gaps not far from these centres, and leaving most of the Highlands, Islands, Borders and Dumfries and Galloway behind.

For many people, this is still an issue; the quality and reliability of connections are still poor. Our present Inquiry encountered examples wherever it went, not only in remote and rural areas but also in cities and suburbs.

The RSE’s *Digital Scotland* report identified the lack of a modern ‘middle mile’ infrastructure (linking communities to the high-speed fibre core network) as a key obstacle that condemned many communities to inferior access to the digital world.

Recent public sector investments in Scotland’s broadband infrastructure (a combination of Broadband Delivery UK [BDUK], EU and local funding) are designed, in large part, to address this issue. More details of the BDUK programme are given in Appendix C.
Digital Scotland

The Scottish Government-led connectivity programme has the laudable aim of **closing the digital divide by putting the right, world-class, future-proofed next generation broadband infrastructure in place to ensure the whole of Scotland can participate in the digital world**\(^\text{10}\).

The **Step Change** programme consists of two live projects.

- The first contract, signed in March 2013 by BT and Highlands and Islands Enterprise (HIE), will deliver next generation broadband across the Highlands and Islands.
- The second contract, signed on 9 July 2013, covers the rest of Scotland (RoS)\(^\text{11}\).

These contracts are intended to “put in place infrastructure that will have the capacity to deliver next generation broadband to 95% of premises by 2017”\(^\text{12}\). The HIE project will fund 1,200 km of new fibre, thus changing the map.

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**Figure 2** BT core fibre network – existing and planned

*Source: Highlands and Islands Enterprise,*


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This investment is certainly a huge improvement. It will bring many people within reach of optical fibre. However, many will still not have access to the superfast speeds that will be available to most. It also seems likely that services suitable for business use will be expensive or unavailable in many areas. This lack of appropriate and reliable access will continue to be a barrier to participation. While the focus of this Inquiry is on the other barriers to participation in Scotland – those that prevail even where the infrastructure is in place and readily available – we believe that lack of access to fit-for-purpose infrastructure will continue to exclude many communities.

For two reasons, current plans will leave Scotland with a significant access divide and deficit that it will be difficult to bridge by 2020.

First, Step Change continues to make use of copper in the ‘final mile’ connection to the premises. Therefore, broadband speeds will always be limited by the distance to fibre. Superfast speeds require short copper – about 1,200 metres is the limit – and since the copper can almost never be laid in a straight line, the practical limit is about 800 metres from the cabinet. Those premises that are three kilometres from fibre as the crow flies are unlikely to get speeds above 3 Mb/s. Beyond that, speeds will rapidly drop below 2Mb/s.

Secondly, in the absence of a universal coverage target, the gap-funding model adopted for BDUK intervention compels providers to serve the most profitable communities, leaving isolated pockets of exclusion. Market provision leads to the same patterns of investment, so we already see such pockets: small communities surrounded by exchanges that are too far away, even within the central belt.

Premises at the fringes of the network, and beyond, will have poor or non-existent connections, with no plans for improvement. A vivid encapsulation of this problem came when we gathered evidence in Shetland. A resident of Unst, Britain’s most northerly inhabited isle, said:

“If the target is 80%, we’ll be in the last twenty; and if the target is 98%, we’ll be in the last two.”

We heard variations on this theme in many parts of Scotland; mainly, but by no means exclusively, in remote areas of the mainland. For example, as well as patchy, sometimes non-existent, coverage in areas such as the northwest corner of Sutherland, we were pointed to part of West Fife, where many residents can see Edinburgh across the Firth of Forth. In this strip of territory, internet access is severely limited and poor infrastructure hinders commercial use of digital technologies. To give a specific example, engineering companies bidding for the same contracts find that when several of them try to upload large tender documents for the same deadline, broadband speeds drop and the process takes many hours.

Although significant improvements will be made by 2017, we conclude that Scotland’s infrastructure will still fall well short of its goals for 2020. We do not see how current plans will ensure that next generation broadband will be available to all by 2020.

Adequate infrastructure investment by public and private sectors is an essential prerequisite for digital society. Government must also provide a legislative and regulatory framework that enables infrastructure access, fosters innovation and investment and prevents nuisance and crime, so that the internet can be enjoyed and exploited by all.

That said, throughout this Inquiry we have proceeded on the ‘heroic assumption’ that current infrastructure initiatives will achieve their goals, and will solve those access problems that are physical rather than social, personal or behavioural.

Much more must be done to derive maximum benefit from this infrastructure. Individuals, businesses and other organisations must have the motivation to use the infrastructure, and the skills required to derive maximum benefit from this investment. Government must ensure that statutory education is fit for the digital age.
Digital Scotland

1.3. Beyond Infrastructure

International comparators

A first measure of digital inclusion is the take-up of fixed broadband. Scotland lags behind the rest of the UK in uptake, even where there is adequate infrastructure. Only 71% of households in Scotland have a fixed internet connection, compared with 80% across the UK. Scotland’s current ambition is to match the UK in broadband uptake. However, Norway, Luxembourg, Sweden and Denmark all have internet penetration above 90%. Scotland’s ambition should be to join this group.

Figure 3 compares Scotland with the nations with highest broadband uptake. If we are to compete with our neighbours, our target must be higher. Less than one thousand premises in Scotland are in data zones with uptake greater than 90%, so we have a long way to go.

<table>
<thead>
<tr>
<th>Country</th>
<th>Regular internet users</th>
<th>Home Internet</th>
<th>Population 1000s</th>
<th>Land area 1000 km²</th>
<th>density 1000/km²</th>
<th>GDP $1000 per capita</th>
</tr>
</thead>
<tbody>
<tr>
<td>Korea</td>
<td>84%</td>
<td>97.4%</td>
<td>50,000</td>
<td>100</td>
<td>500</td>
<td>22</td>
</tr>
<tr>
<td>Iceland</td>
<td>96%</td>
<td>95%</td>
<td>300</td>
<td>100</td>
<td>3</td>
<td>35</td>
</tr>
<tr>
<td>Norway</td>
<td>95%</td>
<td>93%</td>
<td>5,019</td>
<td>385</td>
<td>13</td>
<td>57</td>
</tr>
<tr>
<td>Luxembourg</td>
<td>93%</td>
<td>93%</td>
<td>530</td>
<td>2.5</td>
<td>212</td>
<td>108</td>
</tr>
<tr>
<td>Sweden</td>
<td>94%</td>
<td>92%</td>
<td>9,517</td>
<td>500</td>
<td>19</td>
<td>39</td>
</tr>
<tr>
<td>Denmark</td>
<td>93%</td>
<td>92%</td>
<td>5,590</td>
<td>43</td>
<td>130</td>
<td>40</td>
</tr>
<tr>
<td>Netherlands</td>
<td>93%</td>
<td>94%</td>
<td>16,770</td>
<td>42</td>
<td>399</td>
<td>42</td>
</tr>
<tr>
<td>Scotland</td>
<td>71%</td>
<td>68%</td>
<td>5,295</td>
<td>78</td>
<td>68</td>
<td>41</td>
</tr>
</tbody>
</table>

Korea, Luxembourg, Denmark and the Netherlands have higher population density and gentler geographies than Scotland. However, Iceland, Norway and Sweden demonstrate that low population densities and rugged geography are not insuperable barriers.

Deprivation and geography in Scotland

Across the developed world, digital exclusion is strongly associated with other aspects of social deprivation. The Scottish Index of Multiple Deprivation [SIMD\(^{15}\)] ranks small areas (datazones) across all of Scotland from most deprived to least deprived. We combine Ofcom data\(^{16}\), showing the number of lines and their median speeds for each postcode, with postcode data giving number of addresses, and the SIMD data, to study the relationships between deprivation, provision and uptake in Scotland. Figure 4 shows how uptake varies with deprivation. Within the most deprived 10% of the population of Scotland, broadband uptake is 53%; in the least deprived 10% of the population it is 81%. In between these two extremes, uptake rises steadily as deprivation falls.

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\(^{15}\) Scottish Government, Scottish Index of Multiple Deprivation http://www.scotland.gov.uk/Topics/Statistics/SIMD

\(^{16}\) Ofcom, 2013, UK broadband data postcode level 2013, http://maps.ofcom.org.uk/broadband/
**Figure 4** Digital deprivation in Scotland *(computed from Ofcom and Scottish Government data)*

![Digital deprivation in Scotland](image)

**Figure 5** (below) splits the population across six geographies of the Scottish Urban Rural Classification. The correlation of deprivation and digital exclusion is seen in all six geographies.

**Figure 5** The urban–rural divide *(computed from Ofcom and Scottish Government data)*

![The urban–rural divide](image)

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17 Scottish Government, Urban Rural Classification
http://www.scotland.gov.uk/Topics/Statistics/About/Methodology/UrbanRuralClassification
Within the most deprived communities – the bottom 20% – we see that uptake is generally higher outwith these urban areas. This indicates that an internet connection has more value for those in small towns and rural areas than for those in urban areas. It confirms one of the key messages we took from many consultations – that those in rural areas have greater need of internet access – and makes the extremely low uptake in most remote areas all the more striking.

The curves plotted for remote rural communities and remote small towns suggest that remote geography is a barrier. There are also some anomalies that merit further attention. Closer inspection of the data shows that such geographic variations are found primarily in the Islands, the southern Highlands and the Borders.

Taken together, geography and deprivation account for much of the variation in broadband uptake across Scotland, but we must not over-generalise. Individual datazones still show significant variation. Closer inspection of the data shows that there are rural datazones within the most deprived 10% of Scotland which have uptakes over 80%, and there are also urban datazones within the least deprived 10% of Scotland which have uptakes of less than 40%. Our final report will examine such examples in more detail.

**Speed, distance and demand**

It has been suggested that deprived areas have poor infrastructure, which would lead to lower uptake, but the data does not support this assertion. Each 20% band of deprivation covers postcodes which span the whole range of speeds, from super fast to super slow. For each 20% SIMD band, we plot the uptake for each 2 Mb/s speed band (Figure 6).

**Figure 6 Broadband uptake vs Median speed (computed from Ofcom data)**

![Figure 6]
For every SIMD level, the highest level of broadband uptake is seen at some speed between 2Mb/s and 6Mb/s, uptake then falls as speeds increase to 8–10 Mb/s. When broadband is delivered over copper telephone lines, median speeds increase as you get closer to the exchange or cabinet. So, those with lower speeds typically live further from the exchange. We have already seen that demand increases outside urban areas, all other things being equal. We see the same effect here; distance makes demand grow stronger. Demand is higher from those further from the exchange, even when they get lower speeds.

The fall in demand as speeds drop below 2 Mb/s is also interesting. The fact that the drop is least for the most deprived band of the population, and the fact that uptake by the bottom three bands of the population falls to the same level (around 56% uptake), suggest that, for 56% of those in the areas where speeds are this slow, access to the internet is seen as essential. Demand above this level is discretionary, a matter of choice rather than necessity. Discretionary use rises in response to lowering deprivation and increasing speed.

**Deprivation – a closer look**

The Scottish Index of Multiple Deprivation 2012 combines a number of indicators drawn from seven domains: income, employment, health, education, skills and training, housing, geographic access, and crime. We now look to these ‘domains of deprivation’ for causes of low uptake.

As we have seen, geography is a barrier to internet access in remote areas. The other domains of deprivation present barriers to inclusion right across remote, rural and urban Scotland.

- Employment often provides the occasion for first contact with the internet. Unemployment and most casual employment preclude this opportunity.
- The costs of an internet connection and an access device are a significant barrier for many households. Households that cannot afford a connection cannot participate. Poverty makes the costs of digital participation more significant. Moreover, many disadvantaged families are ineligible for the long-term contracts required by service providers.
- Illiteracy and low educational attainment make the first steps towards digital engagement more difficult and more daunting. Fear, in comprehension and a lack of understanding of the internet and what it can do, often lead people to conclude that the internet is “not for me”.
- Failing health, and mental health, and the onset of disability may make access difficult.
- People and families who are in short-term accommodation or geographically-mobile, be this a life-style choice or because they are homeless, are also unable to establish a home connection.

In chapter 3 (The Digital Divide) we will look in more detail at the ways in which these aspects of deprivation relate to digital exclusion. Deprivation leads to digital exclusion, so one might think that to promote digital inclusion we should first address the causes of deprivation. However, digital inclusion can itself help to address the most important domains of deprivation: income, employment, health, education, skills and training. Digital inclusion should therefore be one of our first priorities.
The Glasgow City example

We conclude this section by focusing on one example. Glasgow City accounts for more than two out of five of the most deprived 15% of the population of Scotland. In Glasgow City one quarter of the working-age population claim key benefits. Such statistics are matched by high levels of digital deprivation. Ofcom’s 2013 Communications Market Report showed that in Glasgow City, only 57% of individuals access the internet by any means (fixed broadband, smartphone, or public provision in a private space), and only 52% have fixed broadband, far fewer than in any other UK city. Birmingham – where 75% access the internet, 73% with fixed broadband – comes closest.

A MORI study, commissioned by the Carnegie UK Trust, focused on the low take-up of fixed broadband in Glasgow. To supplement an earlier Ofcom analysis, this new study conducted “200 in-depth, face-to-face interviews with individuals broadly matching the characteristics of the main demographic groups least likely to have access to the internet”\(^{18}\).

For this sample, cost was important: 40% said it is too expensive; and for 20% the primary reason for not going online was financial.

Lack of knowledge and skills was commonly cited: 31% said the internet is too difficult to learn; 29% found the options confusing; and for 20% one of these was the primary reason. Fear is also common, with 32% worrying about privacy, spam and viruses. This figure is higher than one might expect. Across the UK, Ofcom reports since 2005 have consistently found that such concerns are cited by less than 10% of non-users.

The study also looked at the distinction, within the offline population, between potential users, interested in going online in the future, and rejecters, those who express no such interest. For many of the rejecters, a low level of trust in technology appeared as a significant barrier to going online. Although the sampling methods and small sample size in this study make rigorous extrapolation impossible, it is interesting to note that 57% of non-internet users said they would like to go online in the future. This figure is also higher than one might expect. Across the UK, the vast majority, 73%, of offline adults cite lack of interest as their main reason for not being online, whereas only 19% of the Glasgow sample said that there is nothing on the internet of use or interest for them, and 22% said, “it’s not for me”.

Unfortunately, there are many other areas with similar depths of deprivation. For example, in Clackmannanshire, Dundee City, East Ayrshire, Inverclyde, North Ayrshire, North Lanarkshire and West Dunbartonshire, the figure for those on key benefits is more than one in five. Our analysis of broadband uptake shows that communities with similar SIMD levels of deprivation have the same low levels of broadband uptake across all of Scotland’s urban geographies. This suggests that the findings of the Glasgow survey would be mirrored, on a smaller scale, across Scotland’s other urban areas and accessible small towns.

The Glasgow study tells us that access is an issue, largely because of cost; and motivation is an issue, often because of fears of online threats or technology in general. This is confirmed by evidence we have gathered across urban, rural and remote Scotland, which also shows that literacy is a barrier for many who lack the confidence to go online and, more generally, that lack of skills often limits the benefits individuals can derive from internet use.

To ensure that everyone can use the internet confidently, safely and effectively, we must address these three issues: access, motivation and skills.

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\(^{18}\) The Carnegie UK Trust, 2013, *Across the Divide: Tackling Digital Exclusion in Glasgow*
1.4. Building a Digital Society

The internet has the potential to make the world’s information available and accessible to everyone. “The unique and transformative nature of the Internet,” brings opportunities, to enable individuals to exercise “not only their right to freedom of opinion and expression, but also a range of other human rights, and to promote the progress of society as a whole.” It also brings new risks, new threats and new responsibilities.

In this interim report we focus on the potential benefits – for education, health, wellbeing, the economy, and more – but, to promote the progress of society, we must also address the threats, and assume the responsibilities.

Digital technologies provide new ways to collect, process, communicate and analyse information. However, they also provide new opportunities for deception and deceit, cyber-crime and cyber-war. The technologies that have enabled the open internet, bringing unprecedented access to information, freedom of expression and opportunities for innovation to billions of people around the world, have also enabled unprecedented mass surveillance and new monopolies of information.

Beyond the issue of digital participation by individuals, businesses and organisations, societal issues will affect our ability to derive maximal social benefits from our digital technologies. Many of these issues are not new but they must be revisited in the light of the new capabilities and transnational reach of digital technologies. In this section we briefly consider some of the responsibilities government must assume.

The Human Rights Council of the UN has affirmed the right of all individuals to seek, receive and impart information and ideas of all kinds through the internet. In the report quoted above, the Special Rapporteur to the Human Rights Council of the United Nations focuses on the positive obligation of States to facilitate the enjoyment of the right to freedom of expression via the internet, and analyses the implications of States’ surveillance of communications on the exercise of the human rights to privacy and to freedom of opinion and expression.

By changing the ways we communicate, digital technologies have an impact on fundamental rights. Effective exercise of the rights to freedom of opinion and expression (Art. 19), to work (Art. 23), to education (Art. 26), and to cultural life (Art. 27), increasingly depends on digital inclusion – mastery of the necessary digital skills, and access to an adequate communications infrastructure that is appropriately regulated so that it can be safely enjoyed.

Thus, while digital inclusion is not a fundamental right, it is required to realise these fundamental rights. Government, therefore, must ensure the availability, accessibility, acceptability and quality of digital infrastructure and skills. Government also has obligations to respect, protect and fulfil a right to digital inclusion. Respect means simply not to interfere with the enjoyment of the right. Protect means ensuring (by regulation or otherwise) that third parties (non-state actors) do not infringe upon the enjoyment of the right. Fulfil means taking positive steps to realise wider digital inclusion (e.g. by adopting appropriate legislation, policies or budgetary measures).

In this interim report, we focus primarily on availability, accessibility and fulfilment. However acceptability and quality, protection and respect are also necessary. In our consultations, we found, as did the Carnegie survey in Glasgow, that many of those currently offline in Scotland are worried about issues such as privacy and surveillance, security and trust. It is clear that these must be addressed; they are already barriers to participation for some, and will be fundamental to any healthy digital society.

We plan to return to some of these broader societal issues, such as privacy, identity and anonymity, security and trust, legislation and regulation, openness and standards, rights and responsibilities, in our final report, and welcome evidence on these or other relevant topics.

20 Mr. Frank La Rue, http://www.ohchr.org/EN/ISSUES/FREEDOMOPINION/Pages/OpinionIndex.aspx
2 Digital Dividend

This Inquiry is concerned to find ways to spread the benefits of digital participation, so a key focus has been to revisit the social and economic benefits of the digital revolution, and the dividend to be gained by spreading these benefits more widely. The Economic Case for Digital Inclusion\(^{22}\), a 2009 report commissioned by the UK Champion for Digital Inclusion, Martha Lane Fox, estimated the economic ‘digital dividend’, the economic value of digital inclusion, and quantified the benefits stemming from the fact that digital inclusion:

- offers opportunities for public service providers to realise efficiency savings;
- enables citizens to achieve better education, training and employment; and
- gives consumers access to a wider range of products at lower prices.

The report focused on the economic impacts of these benefits. However, there is also substantial evidence of further benefits of digital inclusion. Given the open potential of the internet, it is impossible to create an exhaustive catalogue of future benefits, but there are clear indications that digital inclusion can:

- reduce the costs and increase the effectiveness of health care;
- enable flexible and home working to expand the workforce, support those with caring responsibilities to remain in employment and reduce commuting miles;
- support independent living for some people who would otherwise be institutionalised;
- afford opportunities for a range of otherwise isolated individuals, including those in minority groups, to participate in society;
- increase the sustainability of remote and rural communities;
- provide social value through access to online communities and resources relevant to people’s interests.

These benefits have both social and economic value: they explain why digital participation has become a central issue for governments, worldwide. When it comes to the social value of the internet in everyday life, however, many of the individuals we consulted as part of this Inquiry saw the internet as a source of entertainment and enjoyment. It provides access to music, on-demand television, games and puzzles. It is increasingly and widely used by the cultural industries to disseminate information and promote their work. It also connects entire communities of hobbyists, gamers and individuals with shared interests, whether these interests are in photography, baking, fashion or ancestry, to list just a few examples. People go online because it is fun, because the internet gives instant access to pictures of cats, to images of a friend’s street in another country, and to information on every imaginable subject. It helps to maintain family ties across the world. It supports new forms of creativity, communication and social interaction.

These are the main motivators that encourage people to make the initial leap to being online. It is only when they are participating that the wider social and economic benefits come into play. For example, they then have the possibility of having a medical condition monitored remotely, of applying for a job online, or of taking an online course in a subject that is not taught nearby. This is due to what has been referred to as the “death of distance” brought about by digital technology. Many of these benefits are particularly valuable to people in remote or deprived communities, the very people who are least likely to be connected today.

We now consider some of the benefits in more detail, drawing on existing evidence and that gathered by this Inquiry. However, it is important to emphasise that the personal benefits outlined here are available only to those who are digitally engaged, while the full extent of wider societal benefits (e.g. public sector efficiency savings, economic growth) can be harnessed only when digital participation is indeed universal across Scotland.

2.1. Education and training

Digital participation enables citizens of all ages to use the learning opportunities available via the internet, to supplement their formal education or to enhance their skills and employability. Formal education also increasingly depends on using digital tools. Digital literacy – the ability to use digital technologies to effectively and safely, locate, manage, analyse, evaluate, create and distribute information – is now as important a foundation for education as literacy. Empowering students with improved critical thinking skills and nuanced understandings of risk and safety will have benefits for internet use, whether associated with the curriculum or in the world of employment and digital citizenship.

The internet also creates opportunities for informal education and lifelong learning. Distance learning courses and online seminars allow users to engage in learning in a much broader way. Videoconferencing and webinars also create opportunity to overcome the challenges of sparse communities and remoteness, by delivering lessons to students who may be in a number of locations. This means that a course that is undersubscribed in one school can be taught from a central location and delivered to pupils in several different schools. In Scotland, the University of the Highlands and Islands has been a trailblazer in the use of these technologies.

Higher and Further Education providers are beginning to embrace online learning. Digital education, or elearning, enables individuals to participate in education no matter where they are located. Online learning can be flexible and learner-centred, allowing people in part-time or full-time work, people with caring responsibilities, people with anxiety or mental health issues, and those with mobility challenges, to engage in formal learning and development. Online degree programmes, particularly at post-graduate level, are growing rapidly, as an increasingly competitive job market drives professionals to enhance their skills.

Designed appropriately, elearning should allow the student to take ownership of his or her own learning and gain an increased sense of confidence and safety. It may also allow access to a broader range of experts and teaching staff than that provided by traditional forms of learning. Teaching and online learning is a fast-developing, innovative area, but access to the internet potentially enables affordable, flexible opportunities for Scotland’s citizens to learn and develop.

2.2. Health

There is a vast array of research, development and innovation being carried out and implemented around the use of digital technologies in the health and social care sectors, including the recent establishment of the Digital Health Institute as an innovation centre for digital health in Scotland.

The potential benefits of increased digital capability and participation to health care providers and end users are well known, and have been well-documented elsewhere (see, for example, Booz & Co. 2012). Digital technology, via smartphone or other hand-held devices for example, offers better communication between healthcare professionals and patients, so that even people who do not have a fixed or long-term address can receive communications about routine check-ups and follow-up care.

Opportunities for telehealth and telecare can reduce the need for people who live in remote areas to travel long distances to their GP. They also provide opportunities for the NHS to increase its efficiency and reduce its costs by attending to non-urgent cases remotely, reducing unscheduled hospital admissions. NHS24 is the provider of Scotland’s national telehealth service. It is responsible for the delivery of clinical assessment and triage, health advice and information by telephone and online services, 24 hours a day, 365 days a year.

In May 2012, the (UK) Department of Health published its strategy ‘The Power of Information: putting all of us in control of the health and care information we need’. The impact assessment that accompanied this strategy identified that, if fully implemented, some £5bn would be saved over ten years. Further work carried out by PricewaterhouseCoopers for the Department of Health suggested that an additional £4.4bn per year could potentially be reinvested in improving care by making better use of information and technology.

The internet can also provide individuals with access to dedicated healthcare advice and support, as well as information about community support in their area. In Scotland, ALISS (Access to Local Information to Support Self-management for people with long-term health conditions) is a website dedicated to signposting support and advice services, and information.

2.3. Social and cultural

Job seeking and employment

‘The internet has revolutionised the way people search for employment. Because of the flexibility it offers, it can also help people keep their jobs, but only those already online can benefit from these opportunities...’

Job searches and applications for employment increasingly take place online. Online job searches make finding employment easier and more efficient for anyone, but the people who can benefit most are those seeking to move from unemployment into work. For anyone seeking to make this move, having the access and the digital skills needed for job searches and to complete online application forms, can open up a world of opportunities. Many jobs are filled through networks, offline and online. In addition to making it easier to access an enormous pool of formally-advertised job opportunities, the internet, and in particular social media, can open the door to job opportunities via less formal interactions.

27 www.aliss.org
28 Booz and Co, 2012
Flexible and remote working

The internet can facilitate flexible and remote working: that in turn can improve employee recruitment, retention, and productivity. Flexible working arrangements are increasingly required by employees with caring responsibilities. An environment in which individuals can effectively balance their working and caring roles by working from home and/or outside normal office hours when necessary can increase participation in the workforce by people who might otherwise withdraw. With the ageing of the UK population, more working-age adults have some responsibility for the care of older relatives; maintaining and increasing their workplace participation will represent a significant benefit, to those individuals and to society.

The opportunity for remote working can also yield significant benefits, especially for isolated rural communities. A key theme that emerged from our Inquiry’s consultations in remote areas and small towns (Lochaber, Tain, Thurso, Lerwick, Kirkwall, Hawick and Dumfries) was the potential benefit to these communities of residents being able to work from home. We heard that if internet speeds were fast enough to facilitate remote working, more people could remain resident and active in these communities, instead of moving to jobs in urban areas. Digital technologies could therefore help to make these communities more sustainable. The ability to connect reliably would allow businesses to open offices in remote small towns, attracting people to the areas, with obvious advantages for local economies. The benefits of remote working are likely to be greatest for people who live in suburbs and rural areas, rather than the centres of Scotland’s cities.

30 Booz and Co, 2012

Increased social interaction

Many of the people we consulted in this Inquiry spoke about the internet as an excellent ‘cure for boredom’. Access to videos on YouTube, to on-demand TV and to opportunities for social networking with friends and family all over the world, provide entertainment and interaction on an unprecedented scale. Not only can access to these media reduce boredom, however. It can also reduce the unhappiness experienced by those who are, for one reason or another, socially isolated or alienated. This could include people living in remote areas, people with mobility issues which may make leaving the house difficult, or people with problems that can make face-to-face social interactions challenging.

For those living in remote towns and villages, the sense of local community might be stronger than in many urban areas. However, a smaller population means that it can be more difficult to find people in the immediate vicinity with shared experiences or interests. This is particularly pertinent for those within minority groups, or those with minority interests. The internet can provide these individuals with access to global communities of people with shared interests and similar experiences. For example, a recovering alcoholic living in a remote community can still access the support of an anonymous forum of people with similar experiences. A young mother in a remote town can share advice and support as part of an online community of other young parents.

“... Young mums in Thurso often live far away from each other and don’t have money to travel, but use Facebook to connect and to arrange to meet as a group.”
Evidence heard at Inquiry meeting in Thurso, July 2013

Individuals living alone, particularly if they have mobility issues, can also benefit from the interaction offered by the internet. Email, social networks and in particular, voice-over IP services, such as Skype, provide opportunities to engage with family members or friends who may live too far away for regular visits. At several consultation sessions, our Inquiry heard that for older people who live alone, and who do not have any family members nearby, Skype is a key motivator for being online because it enables regular, face-to-face communication with loved ones. The ability to see as well as hear loved ones can help maintain more vivid and richer connections between family members and help to enable conversation where hearing is limited. This type of regular interaction reduces feelings of isolation, which can lead to loneliness and depression. According to the Booz & Co report on Universal Digitisation, one in three people over 60 can go a whole week without speaking to anyone, and one in ten can go an entire month without any human contact. Evidence indicates that reducing boredom and loneliness amongst older people can significantly improve mental health and well being.

“My 101 year old gran doesn’t have her own computer... she will use the computer with you. If you take over your laptop she will use Skype to speak with her son in Canada – he’s not young himself (over 70). She would use it if someone is there. She’s not scared or afraid of it. I think she’d be ok with a tablet – considering giving a Nexus for Christmas. She’s in Supported Accommodation.”
Evidence heard at Inquiry meeting in Aberdeen, July 2013

33 Booz and Co, 2012
Digital technology can also be an enabling tool for people with accessibility issues. In consultation with representatives from the accessibility sector, this Inquiry heard that the internet enables individuals with mobility problems to shop online, giving them access to a wealth of choice that they cannot always access by visiting high street stores and shopping centres. We heard that some users of wheelchairs or mobility scooters plan routes with Google maps before leaving the house, because Google Street View lets them identify dropped kerbs on their planned route. This reduces the need to travel long distances out of their way before being able to cross a road. There are also apps that provide assistance to individuals with visual impairments; for example, apps which can identify colours and respond to light and dark, making it easier for the user to identify windows, doors and exits. In these ways, the internet and digital technology can enable people with accessibility issues to engage in social interactions that would previously have been a lot more difficult.

The internet can also provide opportunities for individuals – particularly those living remotely and those unable to travel easily – to participate more readily in political and democratic processes. This can be through contacting MPs and MSPs online via websites such as www.theyworkforyou.com, through signing online petitions, or through accessing government and parliament websites to read reports or watch videos online.

“Highland Council have a webcast, you can go online and see what your representative is doing or not doing. Disenchantment with politics is creating a deficit, this way people can watch what’s going on. It’s good for democracy and representation.”

Evidence heard at Inquiry consultation in Tain, July 2013

2.4. Economic

The digital economy isn’t a panacea for all ills, but it is a game changer, a source of great opportunity; it has the potential to massively increase inequality, or to level the playing field on a grand scale. Globally, digital technologies have fundamentally transformed economies and the marketplace. They offer new ways to gather and analyse business intelligence; channels through which to offer goods and services; access to previously out of reach markets; increased mobility of both employees and customers; and tools such as cloud computing and social media. Both consumers and businesses able to take advantage of digital technologies can realise benefits.

Consumers

Access to the internet can enormously expand consumer choice by providing access to many more sellers online than on the local high street. This wealth of choice enables consumers to identify differently-priced goods and services and to locate specialist goods not available locally. Price comparison sites enable consumers to find the energy deals that are most appropriate for them, the lowest interest rates on credit cards, and the best deals on insurance and other services. This type of wide-scale comparison can also help to increase competition and lower the prices of goods and services available online. Analysis by the Post Office estimates that a digitally excluded household could save around £560 per annum by buying online.


36 As reported in PricewaterhouseCoopers LLP, 2009, Champion for Digital Inclusion: The Economic Case for Digital Inclusion (p53)
Digital Dividend

However, those least likely to be online may be unable to realise these benefits just by going online; for example, they may not be able to make online purchases, which require a credit or debit card, or to set up a direct debit to benefit from lower energy tariffs. In many countries, mobile payments allow people without access to a bank or large financial resources to make secure financial transactions at a low cost.

Organisations

Public, private and third sector organisations can all benefit from using digital technologies. They can reach a wider client base, deliver services more effectively, reduce operating costs, create efficient supply chains, and raise the organisation’s profile. For public and third sector organisations, this can mean reaching more people for less; for private enterprises it can mean improving efficiency and profitability. Organisations in all sectors can also use digital technologies and remote working to retain staff and facilitate part-time working, which may help small organisations to survive.

Public sector organisations

Public sector services can be delivered much more cheaply and efficiently online. According to the Booz & Co report on Universal Digitisation, half of all government services are currently online, but 260 million transactions remain offline.37 Moving this final portion of service delivery online will produce significant cost savings for local and national government. The report estimates that digitising public services can save approximately £1.5 billion annually.

"The big thing we [the public sector] need to do is channel shift – it’s much cheaper if someone switches to online self service; it costs the public sector around 20p per internet transaction, around £1.73 per telephone transaction, and around £7 per transaction made in an office [in person]."

Evidence heard at roundtable with public and third sector representatives in Dundee, July 2013

Besides the cost savings derived from moving services online, the internet and digital technologies can also enable the public sector to deliver a more integrated, efficient service to users. A White Paper, ‘Channel Shift: Realising the Benefits’ identified the creation of customer profiles as one of the most important elements of digital service provision.38

‘Once a profile exists for a customer and a process it becomes possible to automatically provide the appropriate message or information via the appropriate channel at the correct time. This could be a simple notification to parents of school closures due to snow via text and e-mail to prevent calls. It could be a prompt to renew parking permits in order to prevent a spike in demand and to promote an online system. It could be a reminder to bring specific documents to an interview. It could also represent a first stage in a complex process like student loans or housing benefits and provide a link to guidance at appropriate points.’

‘Tell us once’ is an example of the type of integrated service which could be facilitated through greater use of digital technology within the public sector. This service enables people to report a birth or a death to most government organisations to whom this information is relevant, in one go. This service is offered over the phone and online. Whilst there are obvious concerns around data storage and data sharing which need to be addressed in implementing any such scheme, the possibility of public sector departments creating client profiles and safely and securely sharing client information (with permission) is increased by the use of digital technology.

37 Booz and Co, 2012
Third sector organisations

The ability to communicate more effectively and efficiently with service users and supporters is clearly a huge benefit to third sector organisations. In the current economic climate they are under pressure to provide support and advice to more people on lower budgets. In consultation with representatives from third sector organisations, our Inquiry heard that digital technologies can facilitate better interaction with clients and service users. They can make interactions between organisations easier and more efficient, and enable the rapid exchange of shared information, such as through the online MILO database for third sector support organisations established by the Scottish Council for Voluntary Organisations (SCVO).39 They can also provide opportunities for innovative marketing and campaigning. An example we heard of was a charity which uses Facebook to advertise items for sale in its local charity shops. This was a successful marketing technique, with items advertised in this way usually selling within the next day or two.

“Communication and interaction with other organisations is a benefit, it [Digital media] has made it much easier to see what other organisations are doing. You can find information that helps the organisation; you can get a lot of information in.”

“From a marketing side, setting up Facebook accounts for charity shops, something that is put on Facebook usually sells the next day. Helps to make shops a base for communities.”

Evidence heard at Inquiry consultation with third sector representatives

A Lloyds Banking Group survey on use of the internet by 300 small to medium-sized charities found that of those surveyed;

- 73% stated that being online helped them to better interact with their supporters and form closer bonds with their donor base;
- 66% stated that an online presence had helped to raise awareness of their work and bring in new supporters;
- 40% of the charities that had increased their technological maturity ‘a lot’ over the previous two years experienced a growth in donations;
- 35% of charities with a social media account experienced increased donations over the previous two years, compared with 23% with no social media presence;
- 66% stated that being online helped to lower operating costs.40

“We used to ask how can we use digital or social media to get the message out – but the real benefit of digital engagement is how we get the message in, it’s how we interact with clients, members etc. We have let go of the idea of a digital newsletter, we are now more interactive, creating dialogue. Organisations that do this well, you can bring a mass of people and ideas together: Digital gives you scale – one of the benefits is communication with large numbers.”

Evidence heard at Inquiry consultation with third sector representatives

39 http://sva.scvo.org.uk/projects/milo/
40 Booz & Co. 2012 p 26
Digital Dividend

Small, medium and micro enterprises

The SME sector is particularly important in Scotland, where it accounts for over 99% of private sector enterprises. SMEs are vital to the wellbeing of many parts of Scotland, particularly in rural areas, where micro enterprises make up the majority of the business sector.

Online sales and marketing can increase the geographic reach of a company and can increase its profile and its client base. Improved communication with customers via email or online feedback forms provides opportunities for increased customer engagement and satisfaction. Online purchasing of raw materials can reduce costs and increase profit margins by providing access to cheaper products and reducing stock levels. Group purchasing and sales by co-operative business arrangements is also possible online. Greater knowledge of supply and market prices enables more informed decision making by SMEs.

A survey undertaken by Lloyds Banking Group of 677 business owners from a spread of sectors found that of those who use the internet:

- 51% increased sales due to effective marketing and wider geographic reach;
- 54% cut costs through back-office automation and electronic communication;
- 54% improved levels of customer satisfaction, service and retention.

There is substantial evidence that businesses can benefit from even the kind of online presence which requires no expenditure and little effort. For example, both Google and Bing have free business directories – both branded ‘Places for Business’ – that ensure that local searches find relevant businesses. Research carried out by Nielsen for Google shows that such listings effectively bring in custom for a range of businesses supplying local goods, services and entertainment. Other free channels for establishing an online presence include the use of social media, such as Facebook and Twitter, but these require sustained attention.

Of course, digital technologies not only offer potential benefits to existing businesses that are willing to do things differently. They also offer a world of opportunities for those who harness these new technologies in innovative and creative ways. Scotland has a number of thriving technology clusters, including in Glasgow, Edinburgh, Dundee and Aberdeen. Such potentially high-growth businesses are vital to the Scottish economy.

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42 Booz & Co. 2012 p23
3 Digital Divide

Across Scotland, issues of digital exclusion affect a significant proportion of the population. Over 600,000 adults, around 15% of the population, have never used the internet. At least 100,000 will remain beyond the reach of our fixed infrastructure, and over a million people who are, or soon will be within reach of the internet lack the means, motivation or skills required to reap the benefits of a digital society. We must not underestimate the scale of the task.

The **digital divide** is the gap between those who benefit from digital technology and those who do not. It has three key aspects: access, motivation and skills.

- The access divide is fundamental; those who have no access, or poor access, cannot reap the benefits available to those who have good access. Access is not just a matter of availability – affordability is also critical.
- Motivation is also crucial, and essentially personal – different people are excited by different things. But the benefits of communication and sharing of information are essentially social.
- Finally, skills are needed to use these technologies safely, confidently and effectively.

Each of these divides results in digital exclusion – disparities in the ability to access, manage and communicate information. We now consider each of these three obstacles in turn.

### 3.1. Access

Access to the internet is determined by availability and affordability.

#### 3.1.1. Availability

The availability of robust digital infrastructure capable of operating at competitive speeds is a basic requirement to enable digital participation. No matter how motivated an individual or organisation is to fully participate in the online world, they cannot do so without a connection, or with a connection that is too slow to be usable. We have seen that in Scotland, broadband infrastructure investments under the *Step Change* programme aim to deliver next-generation broadband to 95% of premises by 2017. However, those at the end of long copper telephone lines will continue to have slower connections, with no prospect of improvement through simple technology upgrades. As speeds increase elsewhere, this divide will only become more marked. Further, the design of the interventions will result in a network that does not reach all premises, leaving areas with poor connections or no connections at all.

#### 3.1.2. Affordability

In the section on Digital Scotland we observed that digital exclusion is often associated with other indicators of social and economic deprivation. The connection between digital exclusion and socio-economic deprivation has been powerfully confirmed by this Inquiry’s consultations with organisations and individuals with experience of the causes and impacts of deprivation.

The cost of internet connections to the home and devices through which to access the internet are prohibitive to many of those on low incomes. The economic cost of internet to the home is exacerbated for these people by the fact that in most instances, an internet connection also requires a landline, with the associated costs of a monthly line rental. This means that the prices quoted by internet providers for broadband provision often do not represent the full story. Additional costs associated with the set-up and rental of a phone line can escalate basic costs. When many people now pay a monthly fee for mobile phone usage, this ‘hidden’ cost of the internet is regarded as an excessive and non-essential expense. For low income households, in which all outgoing expenses must be very carefully justified, a landline and a broadband connection are simply not affordable.
The economic affordability of an internet connection and access devices is only one of the barriers faced by those experiencing multiple deprivation, however. Many disadvantaged families and individuals, particularly those without a permanent fixed address, are ineligible for the long-term contracts required by service providers. Many of those with low incomes, or in receipt of welfare benefit, do not have bank accounts to organise direct debit payments for phone-lines and/or internet. This typically excludes consumers from the cheapest tariffs. In many cases it is not even possible to acquire an internet connection without setting up a direct debit in advance. In other words, a bank account is a prerequisite for acquiring an internet connection. This presents an insurmountable barrier to many socially excluded people who do not have bank accounts.

Even for people who do have a bank account, the commitment to payment of a monthly direct debit may give access to the best deals, but it also represents a high financial cost if the funds are not available when the payment is requested. For people on low or irregular incomes, this is a huge risk. While those experiencing deprivation often have much to gain from internet access, they often face the greatest barriers to participation. These barriers to participation then result in digital exclusion, which can in turn exacerbate and entrench existing social exclusion and economic deprivation.

“Fife is the third largest local authority area in Scotland by population. Although similar to Scottish averages in, for instance, unemployment rate, this masks inequalities of opportunity and poverty at an area level. Digital exclusion risks making these inequalities worse, as it becomes essential to be online to carry out everyday tasks.”

Evidence provided by Digital Fife, Fife Council, August 2013
3.2. **Motivation**

As more and more people go online, so those who remain offline are increasingly likely to cite lack of interest as the main reason for not having the internet at home (2011: 47%, 2012: 52%, 2013: 63%). This suggests that recent growth in the number of online households results almost entirely from people who would like to be online who have overcome the obstacles of access or affordability, and that efforts to engage those who profess little or no interest in the internet have had limited success.

The motivation to be online, whether for individuals or organisations, depends upon the user’s recognition that digital technologies can open the door to positive, life-enhancing opportunities. It also depends upon a perception that the benefits of digital participation outweigh any associated costs or risks. Motivation therefore has a positive aspect and a negative aspect. Enhancing and elucidating the potential benefits of being online to those who have not yet ‘gone digital’ is important in addressing the positive aspect of motivation. Understanding, and educating individuals and organisations on the real and perceived risks, threats and costs of being online is key in dealing with the negative aspect.

Here we discuss barriers affecting the motivation of individuals and organisations to participate online.

3.2.1. **Understanding positive motivators**

Positive motivators drive people to get online and make the online world attractive, appealing and inviting. These motivators inevitably differ depending on the individual or organisation and their aims, interests and circumstances.

**Individuals**

For individuals who are offline, or who have had only limited experience of the internet, awareness of how the internet might enhance their lives is likely to be limited. This is particularly the case where offline individuals have no friends or family who use the internet and can demonstrate its potential benefits. At consultations in remote rural areas, where access to infrastructure prevents widespread internet use, we heard that local awareness of how the internet might be used is negatively affected. This was thought to affect the motivation of local people to push for better access, or to try the internet out for themselves.

> “Local people and businesses can’t share information about the internet or talk to each other about it, because nothing has happened with regard to the internet here. In the Highlands, anything develops through word of mouth, that is the only way you will change perceptions. There has to be a local champion.”

**Evidence heard at Inquiry consultation in Tain, July 2013**

It is very difficult to get a community online by getting each citizen and business to make an individual decision to go online. It is only when there are other people of interest online, whether friends, people with the same niche hobby, or a business’s actual or potential customer base, that motivation to ‘go digital’ becomes sufficiently strong.

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We also heard in evidence that a UK ‘digital by default’ policy may force individuals to go online, but that this is often resented and serves to reinforce negative attitudes to the internet. Many authorities in Scotland now prefer a policy of ‘digital by desire’, where the strategy is to provide a choice of channels, but to make digital the channel of choice, by providing a good user experience. The hope is that here, as in many other areas, the carrot will be more effective than the stick.

Small, medium and micro organisations

Two-thirds of SMEs and one-fifth of charities have little or no presence online. The evidence shows that a large percentage of small businesses that are online use only email, and some do not even do that, indicating that even those with an online presence are not maximising the available benefits of the digital world. Scotland has many examples of small and micro businesses that are fully digitally engaged, including those whose core business revolves around technologies. In this Inquiry, we wanted to understand why there are still so many organisations that do not feel motivated to engage. Certainly, as we gathered evidence throughout Scotland, we found it particularly difficult to engage with the small business sector. Very few such enterprises responded to our invitations to submit evidence, and to attend evidence-gathering sessions. Evidence of the benefits of ‘going digital’ is clearly not enough to persuade many organisations and small businesses to overcome the barriers to participation.

Much like individuals, businesses and third sector organisations experience different positive motivators to being online, and those that are not already online are likely to have a set of motivators distinct from those who are already online. Many businesses, for example, see the potential benefit of online sales as a huge motivator. In consultation with local SMEs in Dumfries, however, we heard that for businesses selling unique products, online sales provide access to a global marketplace; but local businesses selling globally-available products cannot compete on price in an online marketplace and therefore saw no value to online sales. In Aberdeen, we heard from a social enterprise which produces bespoke products by hand. The staff designing and making the products are all recovering from mental health issues. A key focus of the organisation is to maintain low stress levels in the workplace. For this enterprise, there is a risk that switching to online sales would increase demand beyond a level that the staff could cope with.

Many of the organisations this Inquiry heard from hadn’t yet identified where being online would deliver them any benefits. Many companies equated dismissing interest in selling online as dismissing the online world entirely. Therefore we need to increase understanding among organisations of the additional and distinct benefits for them of online engagement.

“Meeting community groups and asking how they think the internet can help them, most will initially say ‘it’s not for us’, it’s only when you discuss it more that they start to see possible benefits, for example knitting groups buying wool and sharing patterns online. A lot of people are used to a very traditional way of life. There is a wariness about the internet, a reluctance for change.”

Evidence heard at Inquiry consultation in Thurso, July 2013
3.2.2. Understanding negative motivators

Negative motivators are those factors that make people and organisations feel uncomfortable about going online. Before we can overcome these barriers, we first need to understand these, the factors that prevent some people from choosing to engage digitally. Again, these factors differ depending upon the individual, or organisation, their perceptions of risk, their fears, and their understanding of how these can be managed.

Individuals

The usability and suitability of some websites represents a barrier to full access and participation. A frequently cited example during this Inquiry’s consultation sessions was the online forms that benefit claimants now have to complete in order to be eligible for social security benefits of any kind. People we heard from suggested that one form (the application for Universal Credit) takes on average 90 minutes to complete and cannot be saved and returned to. For those who are not digitally literate, the process has been described as very daunting, difficult and overwhelming. Furthermore, for those who do not have internet access at home, the form must be completed on a public-access computer, where sessions are often limited to 30 minutes and where there may be little privacy. Completing this form – which is vital for the livelihoods of those filling it in – can therefore be a frustrating and difficult task, and one that is unlikely to motivate wider digital participation.

A further example of where the unsuitability of content can be a barrier to participation came up in the Inquiry’s consultation with representatives from the accessibility sector. At this session, we heard that while some digital media and apps can be huge enablers, some websites are constructed in such a way that they are inaccessible for people with disabilities. The main example that they mentioned of this was websites that are not compatible with screen-reader software that some visually impaired people use. This software reads what is on the page and helps the visually impaired person to navigate the site. When websites are not designed so that the screen reader can identify navigation tabs or navigate via a clear menu, the software will just read everything on the webpage serially. This can be very time-consuming and fatiguing.

“If you are blind you perceive things serially, you can’t scan. If you have a huge page of something that is not well structured, it will take a long time to get through.….it comes down to information design, how easily and quickly can you get to what you want.”

Evidence heard at Digital Inquiry Roundtable on Accessibility, May 2013

For those who are not familiar with the internet, fear and incomprehension can also be barriers to participation. The media frequently reports on scams, viruses and breaches of privacy via online systems. For someone without first-hand experience and understanding of the internet, these ‘bad news’ stories are often their only exposure to the digital world. Frequently cited apprehensions in this Inquiry’s consultations were fears about what happens to personal data that people put online and who can see this. Some people also expressed reluctance and apprehension with regard to purchasing or banking online, due to fears about the safety and reliability of entering card details. Some of these risks are real and require to be managed, but greater understanding of the protections and precautions available to online consumers, and greater transparency about how organisations will use online data online, would help to address such fears and concerns.
The idea that using digital technologies will require learning new skills and grasping complicated processes is also a barrier for some people. This applies in particular to those with low educational attainment and people who did not engage particularly well with formal education at school. These people may have anxieties about learning new skills and may be particularly reluctant to sign up for formal training or education schemes. For these people, opportunities to have a go with the internet in an informal environment where there is little fear of appearing foolish would be especially useful.

Small and micro organisations
Smaller companies typically have less resource in terms of time, money and human capital. Many therefore struggle to allocate resources to the creation and maintenance of a web-presence. But without a web presence, their business model is likely to be less efficient and sustainable (see Digital Dividend), and as a consequence they will have less time, money and human capital. This ‘vicious circle’ was reflected in our meetings with representatives of small to medium-sized organisations, from both the private and third sectors. Many organisations cited time as a barrier to establishing and maintaining a web presence, to training staff to improve their digital skills, and to keeping themselves and their staff up to date with technological changes and advances.

The speed of change in the digital world, the ‘mystique’ surrounding website design and management, and the lack of time small organisations can dedicate to familiarising themselves with digital media, are ‘disincentives’ to some smaller organisations getting online. They are not, however, insurmountable barriers. Sufficiently motivated organisations can overcome these barriers, with some assistance.
In our consultation with small organisations from the private and the third sectors, organisations that do not actively engage with digital technologies often cited the reluctance of staff to embrace digital technologies and the training required to embed these skills within the organisation.

Smaller organisations that were engaging actively with digital technologies often attributed this to individual ‘digital champions’ as driving this, and enthusing the rest of the staff about the possibilities of digital participation.

Resistance to digital participation is often a considered choice. Some businesses see no obvious advantage in committing time or money to learning how to go online, to reap benefits that they regard as irrelevant or illusory. Others refer to negative experiences, by themselves or others, of online engagement. These lead them to conclude that the risks of digital participation to their organisation’s reputation are higher than the gains. Examples we hear include fears from traders and those in the tourist industry of the impact of a negative review on the company website, or fears of public and third sector representatives about the impact of inappropriate comments made by staff on social media sites. These fears are real and understandable. However, they are manageable and should not be insurmountable barriers to participation. Placing high significance on these fears, and underestimating the benefits of digital participation, could be symptomatic of a lack of understanding of the potential a specific organisation could realise through digital engagement. This is likely to occur where an organisation’s staff have had little exposure to the internet, especially from a business perspective, and are therefore unaware of many of the opportunities available to them.

**Education and Health**

Fear and risk appear to play a significant role in limiting the use of digital technologies in the health and social care sector. Evidence we heard at a session on health centred in large part around questions of when and how it would be acceptable to share clients’ data. A repeated message emerged that there is much confusion around data sharing, that complex governmental protocols aimed at facilitating the sharing of data are not being used by service deliverers and that the core issue is that of building a culture of trust rather than any technical deficiency.

Similarly, fear and an aversion to risk appear to be prevalent in the approach taken by schools to internet access on their premises. At our evidence session on education, and more widely in our evidence gathering, we heard frustrations from teachers and other people on the filters and restrictions on access to content put in place in schools across Scotland. This places significant limitations on teachers’ ability to access materials for the classroom and on pupils’ ability to learn to use the internet in effective and creative ways.

“We have a bizarre situation. We protect kids in the classroom and they step outside and switch on a phone which is unfiltered.”

**Evidence given at Roundtable on Education, August 2013**
Digital Divide

Furthermore, while in Scotland the Curriculum for Excellence does place an ICT responsibility on every teacher, anecdotal evidence suggests that the confidence and motivation to use digital technologies varies greatly between teachers, between schools and between local authority areas. This has a consequent impact on the experiences of pupils.

Recognising that in both the health and education sectors there are clearly valid concerns about privacy, control of data and the protection of young and vulnerable people, we intend to explore these issues further prior to developing our final conclusions and recommendations. Any comments or evidence in these areas would be welcome.

3.3. Skills

Individuals

Lack of skills or knowledge of the internet is most likely to be a barrier for those who have never been required to use a computer or the internet before, e.g. for work or education. This factor is often accompanied by additional indicators of social isolation and exclusion. Amongst those who have not had a formal introduction to digital technologies will be older people who retired before the internet, email etc. became a common feature of working life; people who have not engaged well with education and who have left formal education without becoming computer-literate; and those who have not been recently engaged in employment/education, where computer literacy is increasingly a requirement. It may also include people whose work does not require, by necessity, the use of digital technology or the internet; e.g. painting, decorating, gardening and other manual trades.

Consequently, it is once again the people who may have most to gain who are least likely to be able to benefit from moves towards a digital society and who in fact run the risk of being increasingly excluded. In a recent study, Citizens Advice Scotland surveyed clients seeking advice or assistance with social security benefits on their access to and competence in using the internet. Of those surveyed, only 55% had a computer at home, just 54% had access to the internet at home, and almost three quarters (72%) said that they would struggle to apply for a job online. Only 28% felt that they would be able to complete an online job application unaided. For job seekers to benefit from online job searches and applications, they must have the skills needed to conduct and refine job searches and to fill out online application forms.

Given the current direction of welfare reform in the UK, the opportunity to engage in efficient job searches is essential to many who will find themselves no longer eligible for social security benefits.

Small, medium and micro organisations

Many of the small businesses and third sector organisations we consulted saw a lack of digital skills and understanding of digital content as barriers to establishing and maintaining a web presence, and interacting digitally with customers and service users. We heard that small enterprises have no capacity to leave the business to attend meetings or training events whose relevance to them is not immediately apparent. This explanation is supported by the fact that even organisations that represent the small business sector, such as the Federation of Small Businesses and the Chambers of Commerce, also find it difficult to engage with these businesses.

Business Gateways have high take-up rates for short courses that demonstrate to small businesses how they can use the internet to expand. Typically, however, these courses are not at what might be described as ‘entry level’. Instead, they set out to improve the digital engagement of businesses that are already online. For example, we were told that courses in various parts of Scotland that are designed to show businesses how best to use social media are often over-subscribed.

For those businesses without the relevant skills to set up a web presence, we encountered a lot of apprehension about paying web developers to design and set up websites. Many businesses we heard from preferred to have no web presence at all to paying a third party to set something up for them. Without the understanding and knowledge of what is possible in website development, how much this should cost and how long it should take, organisations felt reluctant to pay for these services.

“A lot of people ignorant about how to set up websites, put in metatags etc. but web developers take liberties with charges and cost.”

Evidence heard at Digital Inquiry consultation in Tain, July 2013

However, it is not only small organisations that are affected by the lack of digital skills. Within the UK, there is a reported 750,000 shortfall of ICT employees. And yet the UK Higher Education Statistics Agency reports that the 2012 cohort of Computer Science (CS) graduates had an employment rate of only 85%, the lowest figure for any subject, significantly less than the overall graduate employment rate of 91%. In fact, employment rates for CS courses at different institutions vary from under 80% to over 98%, suggesting that some courses fail to match the needs of businesses and the market. Skills in computational thinking are required by those in business and public service who seek to exploit digital opportunities. A thriving digital economy requires highly skilled engineers and scientists to support the development and use of social media, big data, analytics, mobility, cyber security and cloud services.


48 Association of Graduate Careers Advisory Services, 2013, HESA Publishes Graduate Employment Figures http://www.agcas.org.uk/articles/709-HESA-publishes-graduate-employment-figures
4 Digital Inclusion

In this report we have set out the rationale for improving levels of digital participation in Scotland. Universal digital inclusion could strengthen Scotland’s economy, facilitate a more efficient and responsive public sector and assist Scotland’s third sector to cope with increasing demand in a time of challenging finances. But moreover, getting all of Scotland’s people online is essential if everyone is to be able to share in the benefits of a digital society; whether this means helping someone who may otherwise require residential care to remain in their home, ensuring that everyone has equal access to job opportunities, or putting people in touch with others with similar interests to share stories, ideas and experiences.

A flourishing digital society requires a robust and comprehensive infrastructure, a competitive market that will deliver affordable access, a fit-for-purpose education system, and legislation that protects citizens from new forms of crime that arise from abuse of digital technologies. These issues are touched upon in this interim report and will be further developed in our final report. However, even as these pillars are put into place, we must consider how to get everyone to ‘go digital’.

We have seen that almost three-quarters of adults who remain offline in the UK say that this is principally due to lack of interest. The evidence we have gathered, together with findings of other studies, suggests that this lack of interest may cover several underlying factors. These include a lack of understanding of what the internet and digital technologies can do; a lack of confidence in being able to learn to use digital technologies; or a fear of loss of privacy or of cybercrime.

Individuals and businesses who do not participate in the online world have to be motivated to take the first step towards digital engagement. The internet can be almost all things to all people. Initiatives aimed at getting people online must identify their interests and demonstrate how the internet can help them to contribute to these interests and to enrich their lives both online and offline. Each individual belongs to many communities. Where one or more of these communities makes effective use of digital communication, there is an incentive to participate. If we do not help people to identify these incentives, they will become increasingly detached from society as services become harder to access offline.

Once both affordable access to the online world and the motivation to get online are in place, people can then be helped to gain the skills they need to use digital technologies safely and effectively. They can learn to assess and manage risk, gain confidence and explore the wider range of benefits of being online. In many cases people and organisations will go on to use digital technologies in innovative ways, becoming creators of digital media and digital content rather than being merely consumers.

We have discussed under ‘Digital Divide’ (chapter 3) the barriers to digital participation in the areas of access, motivation and skills. For each of these areas, we set out below a picture of our emerging conclusions and recommendations on how this can be achieved. These recommendations will be refined in our final report. We will also further investigate and report on the legislation and regulation needed for a well-functioning, innovative and safe digital world.

Finally, we note that there are many initiatives being undertaken across Scotland to improve levels of digital participation, from governmental to grass-roots level. Much of this work is well-designed and has indeed supported individuals to ‘go digital’. However, we fear that these initiatives are far from sufficient to tackle the scale of the problem. Even, generously, estimating that three-quarters of the population of Scotland is online, that leaves over one million people who are not digitally active. This issue of scale is the key challenge facing Scotland in its efforts to become a digital society.

**Conclusion:**
The digital revolution will continue to provide new opportunities for education, health and economic and social wellbeing to those who are online. Offline access to many goods and services will become increasingly rare and expensive. Any who remain offline will be increasingly excluded from society and the economy.

**Recommendation 1:**
The Scottish Government must recognise that every individual has an undeniable right to digital inclusion and should assume overall accountability for ensuring it is available, and accessible to all.

The remaining recommendations of this Interim Report set out the first steps to a Digital Scotland. They address three key areas: **access, motivation and skills.** Access, necessarily, comes first, but it is also essential to ensure that everyone who can access the internet is aware of, and able to reap, the benefits.

### 4.1. Access

A digital society should provide affordable access to a digital infrastructure fit-for-purpose for every citizen and organisation. To be capable of providing the speeds that will be demanded in the foreseeable future, this requires a core fibre network that limits the use of copper, wireless or satellite connections over long distances. Our 2010 *Digital Scotland report* recommended the creation of an open-access fibre hub in, at minimum, every community of 2000 people.

A well-functioning market would see investment from and competition between several providers, driving down costs of broadband connections and improving the quality of packages offered. A range of contracts and payment options would offer flexibility that reflects the circumstances of everyone, regardless of income, housing situation or access to a bank account.

For those unable to purchase an access device or internet connection, a digital society should ensure that publicly-owned devices and connections are made available for public use.

As in the previous chapter of this report, this chapter provides recommendations for overcoming the barriers to access under two headings: availability and affordability.
Digital Inclusion

Availability

People and organisations with no, or slow, broadband connections cannot access the same range of digital services as those with a good connection. For those near enough to optical fibre, speeds will soon be high, and improvements in technology should deliver even higher speed, enabling new applications and services. However, some users will be stuck with slower speeds and with no prospect of improvement until an alternative connection is built. The infrastructure divide will grow, leaving some users stuck at 2 Mb/s while most move to superfast speeds. We propose a definition of digital poverty, so that we can measure and monitor this infrastructure divide.

Just as social exclusion is caused by relative poverty – those in relative poverty are people whose income is less than 60% of the median value – so digital exclusion results from access that is poor relative to that enjoyed by most of the population. Figure 7 shows the distribution of income in the UK. The median income is defined as the value that splits the population into two equal halves. Half of UK households have less than the median income and half have more. Because some are very rich, the median is less than the mean or average income. The poverty line is drawn at 60% of the median income. Slightly more than 15% of the population lives in poverty.

Figure 7 Income distribution for the UK population, 2011/12.
Households Below Average Income, Department for Work and Pensions, June 2013

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Service providers do not release data on distribution of broadband speeds, as they regard it as commercially sensitive. However, the distribution of broadband speeds would look similar, with ‘slow spots’ matching areas of poverty. The distribution is even more lopsided. In Scotland the median speed is around 8 Mb/s. The first quarter of the population gets less than 4 Mb/s, half the median speed. Current government policy recognises that everyone should have access to 2 Mb/s, which happens to be one quarter of the current median speed. As the median speed enjoyed by most rises, so should the minimum speed enjoyed by all. This is necessary if we are to avoid a growing access divide.

**Recommendation 2:**
The Scottish Government must adopt an appropriate definition of *digital poverty* by which to measure and eradicate digital exclusion in Scotland.

- *Digital poverty* should be defined relative to the quality of services available to most.
- This definition should be used by the Scottish Government in ongoing assessment and reporting on digital poverty in Scotland, alongside other measures of deprivation.
- The Scottish Government must commit to eradicating digital poverty in Scotland.

**Recommendation 3:**
All public buildings and new builds must be equipped to provide a broadband internet connection.

- The Scottish Government must make the installation of ducting suitable for fibre a planning requirement of all public works and new build, as recommended in the *Digital Scotland* report (2010).

For individuals who find it difficult to access the internet at home, there is a clear need for public access points where they can use the internet in a relatively private space. Evidence from our consultations suggests that current provision of appropriate public access is not sufficient for meeting this need. Many public libraries have public-access computers, but their effectiveness is often limited by lack of privacy, by the unavailability of trained staff to support users, and by limits upon the time that any one user may spend at a terminal. Also, library budgets are under pressure, not least because the provision of libraries is not a mandatory service. Reduced opening hours and library closures have become common across Scotland, including in areas where people are less likely to have internet access at home.53

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Voluntary organisations, sometimes funded by local government and the enterprise agencies, are working, often against the odds, to bring digital broadband to excluded groups. Citizens Advice Scotland (CAS) provides such a service, but only as part of its normal service to people who seek advice, particularly on social security issues. However, CAS concedes that the impact is limited by the fact that this is not a central part of its mission and by the mismatch between the resources it has and the demand it has identified.

Get IT Together works hard in the Highlands and Islands to bring public access computers to small communities, but they are sometimes frustrated by the reluctance of those who manage public premises, such as village halls, to co-operate by providing space and allowing the installation of the necessary connections. This reluctance was encountered in other areas of Scotland as well.

Throughout Scotland, in urban as well as rural areas, community groups are working hard to bring internet access to excluded groups such as elderly people, people with disabilities, and people who are excluded by social and economic circumstances. The community groups see increasing demand as a result of ‘digital by default’ policies, but no income streams to allow them to service it. Typically, such groups are already underfunded, and often they are funded by short-term grants with no guarantee of continuation.

In addition to the kinds of access noted above, there are publicly-funded suites of computers throughout Scotland to which the communities in which they are situated often have little or no access. All secondary schools and many primary schools provide broadband connections that are used only during school hours and during school terms. We surveyed Education Directors in each Local Authority in Scotland about the availability of public access to their school facilities. Of the 22 responses we received, 17 had no public access whatsoever, or had very restricted access available only on a pre-arranged basis. Only two Local Authorities responded to say that genuinely open public access is a possibility in their schools, and for one of these this was only as part of a pilot project currently underway. A huge opportunity is being missed in Scotland to increase digital participation with minimal additional expenditure.
Recommendation 4:
Local Authorities must permit and facilitate wider public access to local public assets:

- IT suites and wifi connections in schools, colleges and universities, which currently lie idle for many hours each day, should be opened up for public access by the local community at designated times.

- Existing public access should be increased; for example, by extending library opening times and increasing available access to computers and wifi in and around public buildings.

We have heard several reasons for the current denial of public access to publicly funded assets:

- **Security and risk:** It is argued that public access might compromise the security of the system and therefore its educational utility. We have concluded that this is a variant of the common problem we address elsewhere in the report, of unsophisticated risk assessment and risk management. Education authorities could develop an approach to risk that did not have the consequences for access that we have identified.

- **Contractual limitations:** Some education authorities have outsourced information technology services for schools to private companies and in doing so they have not considered how contracts might be specified to allow wider access to the assets. This has led to an inflexibility of provision that would inhibit community use even if the managers of the service wished to encourage it.

- **Professional defensiveness:** There is a sense in which the denial of public access to school computing facilities is a variant of a long-standing problem of how to ensure dual- or multi-use of school facilities. We single this out to emphasise that the absence of access is likely, in many cases, to have little to do with lack of commitment to encouraging digital participation. Rather, it is about professional defensiveness and a reluctance to accept that, first, schools are public and community assets and, second, that education professionals and managers alone should not determine how they are used.

We believe that these factors, while relevant, are not insurmountable. Examining ways these challenges can be managed is an area that we will elaborate upon in the final report.

**Affordability**
A more widespread barrier to access is cost, particularly for people who do not have bank accounts and/or a reliable income.

The almost universal commercial model for broadband provision in the UK is based on delivering an individual service to each subscriber via a dedicated line to the premises. The model was a good fit for analogue telephone technology. However, modern network technologies enable other models. It is technically possible for a business park, or a housing development or a block of flats, to have its own network, connecting tens, hundreds or thousands of subscribers, who share a common connection, or several connections, to the internet. This can be far more cost-effective than buying tens or hundreds or thousands of individual connections from an ISP. This model is little used in the UK, but is common elsewhere; for example, in Sweden. In both urban and rural areas, local community networks can provide internet access by effectively sharing the cost of one or more high-speed connections between a community of users. The development of such networks is often impeded by the lack of affordable access to backhaul.
Digital Inclusion

Recommendation 5:
The Scottish Government must commit to ensuring open access to broadband networks for use by communities, housing associations and other providers, so that affordable internet access is a possibility for all.

- The Scottish and UK Governments must ensure, if necessary by legislation enforced by regulation, that wholesale access to Scotland’s core internet infrastructure is open to communities, housing associations and other providers.

- Social housing providers should develop and share new architectures and business models for the provision of affordable internet access across housing estates and tower blocks. The Wheatley Group has taken this approach in a recent pilot project in Glasgow Housing Association properties. Lessons learned from this project should inform the design of initiatives that can be rolled out at scale.

Good Practice Example: Providing access to housing association tenants
The Wheatley Housing Group recognises the barriers to access faced by many of its tenants and, in response to this, is working with the Scottish Government and BT on a 12-month pilot project in a high-rise building in Knightswood offering internet access to all the flats in this block. The purpose of this study is manifold: to prove that effective internet bandwidth can be provided to homes at a very affordable cost; to show through experiential opportunities that there are benefits to be gained by being online; to break down the digital exclusion barriers; to offer training and drop-in support to tenants; and to build collaborative partnerships to get all citizens online, helping them with education, employability, financial and health opportunities as well as simply having fun. The Housing Association is also developing a business case for possible roll-out to all its tenants and hopes to be able to demonstrate cost savings when tenants access services online instead of in person or over the phone. To aid the study, the Wheatley Group has provided tablet devices to participating tenants. This builds on a very small project in the south of the city, where 12 tenants in three neighbouring buildings tested three different methods of internet connectivity.

Tenants in both locations, who have either not been able to afford internet connections or have not seen the value from being online, are enthusiastically engaging and, in fact, are rebuilding their communities as they help each other to find their way around the maze that is the world wide web.
4.2. **Motivation**

In a well-functioning digital society, everyone will recognise the benefits of being online and using digital technologies in light of their own needs and interests. Organisations, including small and micro enterprises, will understand what digital technologies can do for them. Digital channels for accessing public services, for purchasing goods and services, or for communicating with companies, will be well-designed and easy for all to use, making digital the preferred choice. Legislation and regulation will be in place to hold organisations to account on how they collect, use and store personal data online. Transparency standards would ensure that this is understood by everyone. The legal system will be fit for the digital age and people can be confident that they are as protected from cybercrime as from traditional forms of crime.

Here we outline the recommendations we see as essential to the realisation of a well-functioning digital society, within which positive motivators of digital engagement are enhanced, and negative motivators inhibiting participation are overcome.

**Spreading positive motivators**

Digital media are often used to communicate with interest groups, social networks, friends, neighbours and colleagues. A key motivator of digital participation is belonging to a community whose members are predominantly online. If the majority of people an individual wishes to communicate and associate with are online, that individual is more likely to feel motivated to be online. If the main method of communication for a group to which an individual belongs is digital, that individual is more likely to participate digitally. There is wide variation in digital uptake and inclusion at local level. In some communities, local businesses and service providers see no reason to go online because none of their customers are online, while some individuals see no reason to go online because none of their friends are online – a vicious circle. Programmes that provide access, devices and learning opportunities to small groups have proven more effective than individual interventions.

**Recommendation 6:**

The importance of the network effect in building a critical mass of participation within a community must be recognised.

- Governments at all levels should ensure that subsidies are available to provide connectivity and loans of equipment to bring communities online.
- Enterprise agencies should provide similar support to local small businesses.

A key trend we have identified in this Report is that, across the range of benefits that individuals, communities and organisations can gain through digital participation, those with the most to gain are also, very often, the least likely to engage. Many of the most significant benefits of digital participation (for example the ability to engage in efficient and targeted job searches, or to choose cheaper payment options for services) are long-term and abstract externalities, which may have little immediately apparent value for those to whom they apply. Where there are barriers to digital participation, the motivation to overcome these requires would-be participants to have a clear idea of what the benefits are, and how these will impact their lives in the immediate term. Typically, the things which motivate individuals to be online are the interpersonal social and cultural benefits which can be derived almost immediately; e.g. the ability to be part of an online community or a social network, and to share photos, news and information instantly. Motivations differ according to individual interests and circumstances, however. Offline individuals must be assisted to identify how the online world might enhance their lives and facilitate their interests if digital participation is to be increased.
**Digital Inclusion**

We have encountered a wide range of support services aimed at assisting people with digital skills and confidence, particularly within the third sector. Much of this provision is very contingent upon local capacity and enthusiasm, however, and the range and availability of support differs greatly from place to place. Current efforts to support digital inclusion do not match the scale of the problem. There is a need for overarching, Scotland-wide resources to guide and support the efforts of local groups and organisations to motivate digital engagement.

**Good Practice Example:**

**The Tinder Foundation – supporting community initiatives for digital inclusion**

The Tinder Foundation is a not-for-profit social enterprise that makes good things happen with digital technology. Established in December 2011 as a staff-owned mutual, the 30-strong team supports a network of 5,000 local community partners and works with hundreds of national organisations.

They support thousands of community partners to be smarter in how they use digital technology through the Community How To website, and through the management of the UK online centres network. Since 2010, they've helped more than one million people gain the skills they need to use computers and the internet confidently.

See more at: [http://www.tinderfoundation.org/about#sthash.hZWQtfVr.dpuf](http://www.tinderfoundation.org/about#sthash.hZWQtfVr.dpuf)

**Recommendation 7:**

The Scottish Government should ensure that local efforts to address digital exclusion have national support.

- The Scottish Government should ensure that local groups addressing digital exclusion at community levels have access to appropriate resources and support networks that enable them to share and refine best practice.
- The Scottish Government should provide funding where needed, for the creation and support of local centres addressing issues of digital exclusion.

If users are to be motivated to engage with a range of digital media, their experiences (especially their initial experiences) of the internet are vital. These experiences need to be positive. The public sector must set the example for coherent, navigable and usable websites and digital interfaces, accessible on a range of devices. The private and the third sector should be encouraged and where possible assisted to follow this example.
Overcoming negative motivators

Many people choose not to go online because they are concerned about privacy and security of personal data. Others are afraid of bullying or ridicule. Educational messages around the internet, particularly around safety online, need to reflect more nuanced approaches to risk management, guiding citizens on risks, proportionate responses to risks and approaches that promote safety and security.

**Recommendation 9:**

The Scottish Government should ensure that individuals have access to proportionate opportunities for redress from companies and individuals who abuse the internet.

4.3. **Skills**

The new science of information is critical to the digital society. As science education was recognised as an issue of strategic importance in the early part of the 20th Century, so computer science must be embedded in the core curriculum of the 21st Century digital society. In a fundamental leap away from the teaching of typing skills, spreadsheets and PowerPoint presentations, computational thinking should be ingrained across the curriculum. The education system would provide three strands of digital learning: 1) digital literacy for everyone; 2) comprehensive ICT awareness that can be taken into other specialisms; and 3) informatics and computing science on a par with other scientific subjects. School, college and university courses should be designed with the needs of business and industry in mind.

Support should be provided to everyone who has not acquired the skills they need to participate in the digital world through formal education. This support should be well signposted and easy to access. A range of learning styles and environments would cater to the needs of people who shy away from formal learning and would include local digital champions, peer-to-peer learning and support from family and friends. This would apply not only to individuals but also to businesses and other organisations, as they acquire the skills they need to develop and maintain an online presence.
Digital Inclusion

Individuals
A digital society requires a range of digital skills going beyond universal digital literacy. While the SQA is to be supported in its ongoing curriculum development in software and systems technology, Scotland’s education systems, like those elsewhere, do not meet the needs of a digital society. Just as a key part of education has always been to learn to communicate with other people, so now we have to learn how to use these new technologies to communicate effectively with people and machines. In addition to reading, writing and arithmetic, we should add ‘digital literacy’ – the ability to safely navigate the digital world – and computational thinking to every child’s analytical abilities.

Scotland has recognised computer science within the Curriculum for Excellence currently being implemented in all Scottish schools. However, the subject has not been classed as a science with biology, chemistry, physics and environmental science, but as a technology, alongside graphic communication, design and manufacture, engineering science, practical woodworking, practical metalworking and practical electronics. This placement is reflected in a course of study that emphasises practical skills over fundamental understanding. While this will develop computational thinking, and be a useful qualification for some – for example those who will go on to apply computing technologies in other fields – it does not provide the levels of understanding that will be required for the design and creation of digital tools and solutions in a truly digital society.

As things stand, in specification for the Computer Science Higher, the mandatory skills, knowledge and understanding required have little of the depth and rigour of the mandatory knowledge requirements for Physics, Chemistry and Biology. The same is true of the draft Advanced Higher Specification, and there is no agreement within the Scottish Universities’ Informatics and Computer Science Alliance that these qualifications should be required for entrance to degree programmes in computing in Scotland. The strands of education we discussed above – digital literacy, computational thinking, information technology and informatics and computer science – are, or should be, intertwined through all levels of the curriculum. To meet this requirement within the Scottish context, we would have a clearly defined computer science curriculum, within the science stream, and with depth and rigour on a par with other science subjects.

Recommendation 10:
The Scottish Government must ensure that the Scottish education system – pre-school, primary, secondary and tertiary – is equipped and able to provide the education and training in digital literacy, software and systems technology, informatics and computer science. All are required by a digital society.

- Digital literacy should be as much of a critical overarching element of the national curriculum as are literacy and numeracy. Therefore, teachers of all subjects should be both using digital technology and developing the digital skills of their students during their teaching.

- Scotland should have clearly defined outcomes for computer science, taught as a science on a par with other science subjects, both within broad general education and in the senior phase qualification courses. The Scottish Government should revisit this subject, in consultation with employers and universities, to ensure that the Scottish education system provides for the needs of a digital society.
The Scottish Government has recently provided funding for a programme of professional learning for Scotland’s computing teachers. This is a positive step, however it does not address the lack of digital skills and confidence amongst other teaching staff. All teachers must have basic digital skills if they are to demonstrate and teach these within their classes.

**Recommendation 11:**
The Scottish Government should ensure that Scottish primary and secondary teachers are able to demonstrate appropriate digital skills within their classes. Refresher courses in digital literacy and computer skills appropriate to the level and subject of instruction should be made available for all teachers who are not confident using the internet or computers in their classes. The recent introduction of ‘The Standard for Career-Long Professional Learning: supporting the development of teacher professional learning’ by the General Teaching Council of Scotland, is a potential mechanism to support this recommendation.

**Recommendation 12:**
There should be specific provision to address the needs of adult learners who have never had the opportunity to develop digital literacy. This is an urgent prerequisite for digital inclusion.

- Providers of lifelong and community education should similarly ensure that they are equipped and skilled to support students in developing digital literacy and computer skills appropriate to the focus of study.

**Good Practice Example:**
*Digital Fife – Supporting ‘Fifers’ to get online and use the internet regularly*

www.digitalfife.com is a portal which has been developed over the past ten years into a successful community-led initiative. Central to this are the 300 websites, which community groups have developed using Digital Fife tools. These websites represent a wide range of issues and interests, including tenants’ associations and groups representing health and wellbeing issues, as well as environmental, heritage and arts groups.

Through these free websites, community groups and Digital Fife deliver online learning on a range of topics relevant to groups and individuals, from accessing government services online, to supporting volunteers, through to how to shop safely online.

Over 1250 learners have so far registered for online courses. Both the website creation and online learning are supported using a digital champion model, with those having learnt new skills then becoming involved in the training events and supporting those new to using digital technology. A recent partnership with Digital Unite, a national charity, has led to Digital Fife hosting, *How To Guides*, which are free and accessible to all. The work is Fife-wide and training and network events are regularly run across Fife.

See more at www.digitalfife.com
Digital Inclusion

Many individuals who do not yet use digital technologies do not have the ‘digital literacy’ skills needed to take the first step to getting online. Some of those who are online have only a very narrow set of digital capabilities; for example, using social media sites and apps. They have not acquired the more sophisticated digital skills that they need to reap the wider benefits, for example filling in online applications, sending emails, etc. For many people who have left formal education, particularly those who did not engage with school and did not enjoy their time there, a formal approach to skills training is not appropriate.

Many initiatives are being implemented in Scotland, particularly by the third sector, to assist people in acquiring skills in the use of digital technology. However, coordination and referral between organisations delivering these services is patchy, and available support differs greatly from one Local Authority area to another.

Recommendation 13:
Public and third sector initiatives providing online skills training should be coordinated under an overarching digital skills initiative.

- The Scottish Government should provide a Scotland-wide registry of available training and support services for individuals, which can be used by public and voluntary sector support providers for referring individuals on to appropriate support.
- The Scottish Government should provide funding to allow local support groups and services to access and shared resources and support.

Good Practice Example: The Tinder Foundation Baking with Friends

Running from the start of Spring Online on April 22, through to the end of Adult Learners’ Week on May 24 2013, [UK online] centres were encouraged to register for the campaign and make use of a toolkit of recipes, instructional videos and marketing materials to get new learners into their centre to bake with friends.

Digital skills were incorporated into the activity plans by asking the centres taking part to encourage learners to access the instructional videos on YouTube, find recipes online – or healthier alternatives to the more indulgent recipes – and to use digital tools to convert units of measurement.

More than 80 centres held events, some with nothing more than a microwave, or even just a clean table and a fridge. The reaction to the campaign was hugely positive, with 90% of participating centres using the event to promote their adult learning provision. 80% of learners that took part in a Baking with Friends event said they felt more confident with maths, and computers and the internet.

See more at:
http://www.tinderfoundation.org/what-we-do/baking-friends#sthash.OQVNS6DK.dpuf
Organisations
Evidence we gathered throughout our Inquiry clearly indicates that, together with issues around understanding the benefits of digital participation and having the motivation to engage, a lack of digital skills, and time or money to invest in those skills, continues to be a fundamental barrier to small and micro organisations. However, we have also seen, for example in the Lloyds Banking Group Survey that even a minimal online presence can bring benefits to an organisation.

Most small and medium enterprises, across the UK, are not making effective use of digital tools. Many micro enterprises (with fewer than ten employees) in Scotland see no reason to go online, and most of those who are online have no access to reliable and impartial advice. Many could benefit from the use of various free online services, but local providers have no incentive to lead them to these. An online presence today is as important as a telephone directory listing once was.

Recommendation 14:
Enterprise agencies must develop simple checklists of free online services and tools – such as business listings, appointments diaries, blogs and calendars – and use these to help businesses to engage with the online world.

Recommendation 15:
Enterprise organisations should establish and support regular local ‘MeetUps’ for SMEs, where they can explore potential benefits of digital engagement and share skills and knowledge, and where local service providers can meet with potential clients and establish their trust.

Motivating small business owners and staff to dedicate limited human and economic resource into developing and maintaining digital skills and capabilities is a major challenge. Digital skills training packages must be clearly linked to sustainable business models and opportunities for growth if SMEs are to be convinced that it is worth devoting time and resources to upskilling their employees. Much current support from enterprise agencies is directed at businesses that are already online.

Recommendation 16:
Enterprise organisations should provide well targeted and well packaged initiatives aimed at providing support for SMEs to make the small, entry-level steps necessary to establish a web presence and other basic digital skills. Advice on costs and suitability of different web packages and digital media should be an integral part of such initiatives.
Digital Inclusion

Good Practice Example: India Get Your Business Online
Launched in November 2011, India Get Your Business Online is a Google-led program to help Indian businesses go online. It has already developed and published 250,000 websites for small and medium business in India, spread across 8,200 cities and towns.

Small businesses are vital in their contribution to India’s socio-economic development.

The nation’s small businesses account for 95% of the industrial units in the country and are the second-largest employers of human resources. Almost 45% of the total exports from India are dependent on small businesses. Although the majority of consumers look online for local products and services, many small businesses neither have a website nor any online presence. This makes them invisible to many potential customers.

India Get [Your Business] Online provides companies with a domain and website, free for one year, and online tools so that they can run their businesses efficiently. When the year is over, customers have no obligation and can migrate their domain to another provider.

See more http://www.indiagetonline.in/

There are over 100,000 small business addresses in Scotland. Most of these will require some help developing digital skills. Small-scale skills training sessions do not match the scale of the problem. There is a need for a scalable digital skills training amongst SMEs. Peer-to-peer learning presents an opportunity for business owners who have developed some digital competence to share their skills with others, and to address gaps in their knowledge also. Once basic skills have been established – i.e. logging into a computer and finding websites using the address bar – there is opportunity to deliver further skills training and support at scale via online learning resources. Video tutorials and demonstrations, email advice and online support forums could all be used to deliver assistance and support to businesses wanting to enhance their digital capabilities.

Recommendaion 17:
Enterprise organisations and support agencies must rely primarily on peer-to-peer learning and supported online learning to match the scale of the problem. National intervention should focus on providing appropriate online materials and support mechanisms that allow these to be refined and adapted in response to feedback from users.

Most offline businesses do not have the skills required to specify requirements and evaluate providers of digital services.

Recommendation 18:
Enterprise organisations must provide skills training for businesses to specify requirements and evaluate providers of digital services.

- Enterprise organisations in Scotland should establish initiatives for the recognition of skilled and reputable web developers in order to support SMEs in identifying reliable and digitally-skilled providers.

- As part of the support given to SMEs, enterprise organisations should provide guidelines on writing appropriate specifications for digital contracts, for example template briefs, example bids etc. Many web developers and IT companies are themselves SMEs and in order to price and produce appropriate work they must be assured that customers are able to articulate their needs adequately.
Appendices

Appendix A
Committee Membership

Professor Michael Fourman FRSE FBCS (Chair)
Professor Alan Alexander OBE FRSE (Co-Chair)
Professor Frank Bechhofer FRSE
Dr Janet Brown FRSE
Norman MacAskill
Dr Darryl Mead
Professor Johanna Moore FRSE
Nicola Osborne
Dr Sarah Skerrat
Martyn Wade
Elizabeth Hemsley (secretariat)
Susan Lennox (secretariat)
Appendices

** Appendix B **

** Financial support and thanks **

The Royal Society of Edinburgh is a wholly independent body and the funding for the Inquiry therefore had to be raised from a variety of sources. We are most grateful to the following organisations whose support has enabled us to undertake this project.

** Arqiva **

** The Binks Trust **

** BT **

** City of Edinburgh Council **

** Creative Scotland **

** Pulsant **

** Scottish Cities Alliance **

** Scottish Enterprise **

** Scottish Government **

We would also like to extend our thanks to the University of Edinburgh, EDINA, the National Library of Scotland, the Scottish Qualifications Authority and SRUC for allowing their members to participate in the Inquiry Committee.
Appendix C

The BDUK programme

Broadband Delivery UK (BDUK), a team within the UK Government Department for Culture, Media and Sport (DCMS), manages a programme intended to make superfast broadband available to 90% of premises in each area of the UK.

Local authorities and the devolved administrations are responsible for individual projects, as set out in BDUK’s delivery model.¹

The framework was initially competitively tendered, but all contracts awarded have been won by BT. Fujitsu, the sole remaining competitor, withdrew from the Broadband Delivery UK (BDUK) procurement process in March 2013. This programme is currently expected to be delivered in 2017, nearly two years later than initially planned.²

Initial modelling found 1,392,322 premises in Scotland (approximately 800,000 HIE and 600,000 RoS) eligible for public subsidy. Scotland was allocated £100.8 million of BDUK funding. This has been supplemented by a further £183.4 m of public funds, from national and local government budgets, and EU investment through the European Regional Development Fund (ERDF), to fund the Scottish Government’s Step Change project.

<table>
<thead>
<tr>
<th>Public £m</th>
<th>BT £m</th>
<th>Total £m</th>
<th>Coverage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highlands and Islands</td>
<td>126.6</td>
<td>19.4</td>
<td>146</td>
</tr>
<tr>
<td>Rest of Scotland</td>
<td>157.6</td>
<td>106.7</td>
<td>264.3</td>
</tr>
</tbody>
</table>

Two contracts have been awarded, together covering the whole of Scotland. The first, procured through Highlands and Islands Enterprise (HIE), covers their enterprise area³. The second covers the rest of Scotland (RoS)⁴. The coverage figures given here refer to ‘next generation access’ – connection to a next generation cabinet – as a percentage of the total population. However, superfast speeds will not be available to those much more than 1km from the cabinet. The premises able to benefit from superfast speeds may be as low as 60% (HIE) and 80% (RoS). This could leave some 400,000 premises – roughly a million people – without superfast broadband. The final figures will depend on the details of BT’s strategic copper realignment (CuRE), which should establish some new cabinets closer to consumer premises.

The second part of the BDUK ambition is to provide universal access to ‘standard broadband’, to “ensure that rural, as well as urban, areas are provided with good online access with a minimum of 2Mbps.”⁵

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¹ Department For Culture, Media and Sport 2013 ‘Broadband Delivery UK’ https://www.gov.uk/broadband-delivery-uk
³ The Highlands and Islands Broadband project includes the following local authority areas: Highland, Moray, Orkney Islands, Shetland Islands, Eilean Siar (Western Isles), parts of Argyll and Bute and part of North Ayrshire (Islands).
⁴ The Rest of Scotland includes: Aberdeen City, Aberdeenshire, Angus, parts of Argyll & Bute, Clackmannanshire, Dumfries & Galloway, Dundee City, East Ayrshire, East Dunbartonshire, East Lothian, East Renfrewshire, City of Edinburgh, Falkirk, Fife, Glasgow City, Inverclyde, Midlothian, North Ayrshire (apart from the Islands), North Lanarkshire, Perth & Kinross, Renfrewshire, Scottish Borders, South Ayrshire, South Lanarkshire, Stirling, West Dunbartonshire, West Lothian.
⁵ Department for Culture, Media and Sport 2013
<table>
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<tr>
<th><strong>Glossary</strong></th>
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<tr>
<td><strong>ADSL</strong></td>
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<td><strong>ADSL+</strong></td>
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<tr>
<td><strong>app (application)</strong></td>
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<tr>
<td><strong>backhaul</strong></td>
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<td><strong>broadband</strong></td>
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<td><strong>cloud computing</strong></td>
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<td><strong>computing science (CS)</strong></td>
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<td>digital divide</td>
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<td>informatics</td>
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</table>
information technology (IT) the branch of engineering that deals with systems that use computers and telecommunications in industry, commerce, the arts and elsewhere, to retrieve, store, process and communicate information

internet an interconnected network of networks that connects computers around the world to almost a billion hosts

internet addiction compulsive use of the internet that interferes with daily life

latency the minimum round-trip time for a query and response

long tail the huge number of niche services available online that will be of interest to relatively small numbers of users (i.e. in the tail of the demand curve)

median the median value of a dataset is the figure which divides population into two equal groups, one having values less than that amount and the other having values above that amount

next generation next generation broadband is a marketing term that has been used by BT to describe broadband delivered over both advanced copper (ADSL+) and fibre-optic (FTTC or FTTP) technology

social media interaction among people in which they create, share, and/or exchange information and ideas in virtual communities and networks through mobile and web technologies

superfast A term introduced by Ofcom to describe next generation broadband services; originally described as services that provide a maximum download speed greater than 24 Mb/s, "the maximum speed that can be supported on current generation (copper-based) networks."

VDSL Very-high-bit-rate DSL offers very high data rates over relatively short distances

VDSL2 VDSL variant, marketed as 'up to 80 Mb/s' BT Infinity