BCS, The Chartered Institute for IT's response to the Scottish Government's Renewing Scotland's full potential in a digital world: a consultation on the Digital Strategy for Scotland

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BCS, The Chartered Institute for IT

The purpose of BCS as defined by its Royal Charter is to promote and advance the education and practice of computing for the benefit of the public. We bring together industry, academics, practitioners, and government to share knowledge, promote new thinking, inform the design of new curricula, shape public policy and inform the public. As the professional membership and accreditation body for IT, we serve nearly 60,000 members including practitioners, businesses, academics, and students, in Scotland, the wider UK and internationally. We also accredit the computing degree courses in ninety-eight universities around the UK. As a leading IT qualification body, we offer a range of widely recognised professional and end-user qualifications.

BCS is pleased to submit a response to this consultation and is particularly pleased that the discussion document and consultation is being co-produced with COSLA and has the support of the Improvement Service and NHS Scotland. A strong voice for local government and other stakeholders is welcome as part of a functional strategy with checks and balances.

Executive Summary

BCS Priorities for the Scottish Government's Digital Strategy to achieve the highest standards of integrity, quality, and ethical enquiry:

- Deliver effective, secure, independent, and ethical digital and data governance, including clear structures and procedures
- Workers across programmes should be delivering against internationally recognised professional standards in IT and digital skills
- Inter and intra governmental cooperation
- Universal upskilling in digital awareness and skills

A primary area of concern for any digital strategy is the strength of effective data governance and how well that is supported by ethical and inclusive decision-making in its oversight. BCS supports the Capgemini eGovernment Scotland Benchmark Report 2020's[1] recommendation that "effective data governance is imperative for Governments that aim to join-up services and become data driven"; fundamentally this culture will be led by the strength of ethical enquiry and inclusivity demanded by the Scottish Government.
BCS hopes the Scottish Government makes clear how it intends to **deliver effective, secure, independent, and ethical digital and data governance, including clear structures and procedures** to oversee and administer what is a fundamental shift in public service delivery and the way we live our lives.

BCS also makes clear the need to identify and deliver support to develop and maintain appropriate digital skills and knowledge amongst a critical mass of workers, not only technicians and practitioners, but also decision makers and gatekeepers in parts of the machinery of public administration where previously there has been less need. **To achieve the highest standards of integrity, quality and ethical enquiry, workers across programmes should be delivering to internationally recognised professional standards in IT and digital skills.**

The **emphasis on collaboration and partnership is welcome and critical to the success of the Scottish Government's Digital Strategy**. Like any digital strategy, success is dependent on all partners with responsibility for governance and delivery, including the UK Government, Scottish Government, public sector, private industry, third sector, and civil society, to work effectively together for the benefit of all.

To deliver the necessary infrastructure and streamlined services it is vital that a culture of openness and challenge is established amongst delivery partners so issues of concern are easily raised, listened to, and responded to promptly by experts. The Capgemini eGovernment Scotland Benchmark Report 2020[2] identifies the need for Scotland's digital public services to become more closely integrated; in an area demanding universal upskilling in digital awareness and skills, a culture of openness to challenge is vital.

This document is the BCS response to the Scottish Government's Renewing Scotland's full potential in a digital world: a consultation on the Digital Strategy for Scotland[3]. This document has been developed in collaboration with the BCS member community in Scotland[4]. We look forward to supporting and adding value to the strategy as it matures through our member networks and communities of practice across Scotland, the UK and wider world.

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[1] https://www.capgemini.com/gb-en/wp-content/uploads/sites/3/2020/12/344112020_eGovernment-Benchmark-Scotland-2020.pdf
[2] https://www.capgemini.com/gb-en/wp-content/uploads/sites/3/2020/12/344112020_eGovernment-Benchmark-Scotland-2020.pdf
[3] https://www.gov.scot/publications/renewing-scotlands-full-potential-digital-world/
[4] https://scotland.bcs.org/

BCS response:

1. **Do you think there are opportunities to realise this collaborative approach?**

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2. **Of the opportunities which you have identified, which do you think are the priority ones?**

The Scottish Government has a strong track record of collaboration with communities and the third sector, BCS is keen to see this developed to routinely include increased strategic engagement with IT and digital professionals and educators, and digital communities of practice from across Scotland's stakeholder groups as well as thematic expert groups outwith Scotland.

This targeted engagement will increase the flow of real-time intelligence and digital problem solving direct from the digital shopfloor. Developing a strategic feedback loop with IT professionals as part of a collaborative approach will help the strategy's outputs to grow in depth, resilience and reach to ensure no communities are left behind.

IT professionals bound by professional standards and competency frameworks such as the Skills for the Information Age (SFIA) Framework[5], are independently validated and function as an under-consulted technical knowledge hub; often they are the gatekeepers of delivery and progress and are key to matching up the political and strategic objectives with practical realities. Similarly, IT educators are on the frontline of the drive to deliver digital skills for the future both economically and societally. Early and continued engagement with IT professionals and educators is fundamental to success, providing insight and intelligence on the broad and often unintended consequences of strategic decision making.

BCS convenes over 50 member communities of practice in key areas of IT and digital practice such as digital healthcare, cyber security, software testing, digital skills, law and diversity, inclusion and ethics. BCS also convenes regional member communities across the UK and wider world, with a number currently operating in Scotland. BCS also administers the Computing at Schools (CAS) Network - a project joint funded by BCS, Microsoft, Google, Ensoft and the Council of Professors and Heads of Computing. It networks and supports thousands of teachers across the UK and in Scotland, CAS is chaired by Professor Quintin Cutts of the University of Glasgow. These communities are perfectly positioned to provide invaluable knowledge and insight to the Scottish Government's digital strategy and future planning. This group would be particularly valuable as part of the equality and inclusion impact assessment and evaluation of the digital strategy to assess any moral, environmental, regulatory and security concerns.

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[5] https://www.sfia-online.org/en

3. **Is the vision that we have set out in the supporting narrative in each of these sections the right one?**

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4. **Do you think that the potential actions set out in each section will deliver the vision set out in the supporting narrative?**

Yes

No One Left Behind

The focus on access to the internet and delivering broadband coverage is welcome, navigating the complexities of reserved and devolved areas of responsibility and liability is fundamental to the success of this programme of work. Accessibility in terms of cost of broadband connection is something that should be considered as part of this strategy. Cost is known to stop some people, particularly women, from getting broadband at home, just 40 per cent of households in Scotland with an income of £17,500 have broadband[6].

A continued focus on the delivery of 4G mobile coverage for both economic and social considerations is fundamental to enable many individuals and communities to thrive; universal 4G would arguably be of greater immediate practical benefit than the roll out of 5G technology.

The Office for National Statistics and the Scottish Government reported[7] in 2019 that smartphones are now the most common device to access the internet with 86% of people accessing the internet this way and a huge 96 per cent of 16-24-year-olds in Scotland using their phones to get online.

The development of a new National Digital Learning Strategy for Scotland is an important development and BCS and our member communities are keen to support in any way it can.

Services Working for All

A robust, iterative, well-resourced, and professionalised approach to data protection is fundamental to digital service delivery. Frontline delivery has never been more dependent on the professional skills and competencies of back-office IT staff. The Covid19 pandemic demonstrated the value and ubiquity of technology in our lives, but it also exposed our reliance and our vulnerabilities. To deliver on the potential of digital transformation, we must continue to invest sustainably in critical digital infrastructure, in terms of hardware

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[6] https://www.carnegieuktrust.org.uk/publications/across-the-divide-full-report/
[7] https://www.gov.scot/binaries/content/documents/govscot/publications/statistics/2020/09/scottish-household-survey-2019-key-findings/documents/scotlands-people-annual-report-key-findings-2019/scotlands-people-annual-report-key-findings-2019/govscot%3Adocument/scotlands-people-annual-report-key-findings-2019.pdf

and software, and more fundamentally in the skills and professional competencies of those tasked to deliver the digital infrastructure of our frontline services.

The 2012 Scottish Government-commissioned report by BAS and Kalba International, "Digital Scotland 2020: Achieving World-Class Digital Infrastructure[8]", noted the Scottish Government's commitment to developing and delivering world-class digital infrastructure across Scotland by 2020. Our Scottish BCS members, whilst acknowledging significant improvements over past 5 years, indicate their experience is that fast broadband as well as basic mobile coverage is still far from world-class. Basic connectivity to every inhabited residence and business remains a primary essential need.

We must work to raise the professional standards of our IT and digital workers wholesale; we know from high-profile breaches of cyber security and data protection legislation that corporate governance and delivery of digital strategies is only as good as the weakest link. Professional standards provide safeguards and accountability for a group of workers whose influence in our lives has far outpaced our cultural understanding of the need for professional standards and qualifications that match this responsibility and liability. **The IT and digital industries are key to our future, we must protect them and our wider environments by developing the culture of professionalism that it requires and deserves.** The Scottish Government's positioning, tenacity and the unique Scottish public sector infrastructure is well placed to drive progressive and insightful agendas such as this.

To allow resource to be focussed on the frontline, it is imperative that there is clear understanding amongst decision makers that IT and back-office functions are mission-critical in delivering frontline services, with material and in many contexts, existential, threats to organisations, individuals, and communities if mistakes are made.

Significant savings and improvements may be achieved by streamlining, collaborating, and using common cloud-based technologies, these must however be a consequence of, not a driving imperative for these actions. It is important to challenge a narrative that IT and digital strategies and solutions are cost-saving initiatives, and it is important for organisations such as the Scottish Government to provide clarity in this area, specifically around the primacy of data protection, online safeguarding, and cyber security and how these are communicated effectively across communities and populations.

Chief Information and Technical Officers across key stakeholder organisations should be, by default, included within the highest levels of governance, provided with the resource and level of organisational insight to be able to advocate and influence effectively for their areas of responsibility, mitigate risk to digital infrastructure and data integrity. Delivering this will eventually help support services to become more proactive and future focussed.

The commitment to adopt common digital and data standards is welcome and we would encourage the Scottish Government to learn from the work undertaken at the UK and international levels in this area. The collection, storage and dissemination of data should absolutely be within legal and ethical standards and approaches to meet user needs but there is often an over-caution and under-utilisation of data that stems from an under-

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[8] https://www.nls.uk/scotgov/2013/9781782564041.pdf

developed understanding of the current data-protection legislation landscape; this is a prime example of where a community of practice in data protection and domestic and international IT Law would be of great value to service delivery. It would be particularly useful to contribute to the development of the ethical framework around Scotland's data, in particular how those working to deliver Scotland's digital strategy are supported with the digital skills, professional standards and learning to develop the highest level of ethical enquiry. These professionals should in BCS' view, be able to challenge decisions based on such concerns in an area where ethics and ethical norms are continually evolving and are yet to feed into the public consciousness at critical mass.

Scaling up the Ethical Artificial Intelligence MSc Pipeline[9], the independent review written by BCS on behalf of the UK Government's Office for AI looked at how the UK could produce enough MSc graduates with the requisite knowledge and skills to design, develop, deploy, manage, and maintain AI products and services to meet the country's needs.

The review identified that the top priority for the UK Government is to create a "diverse, inclusive, substantial pipeline of ethical, competent and talented MSc graduates highly skilled in Machine Learning and Artificial Intelligence". Although this review looked at one specific area of the UK's knowledge and skills infrastructure, these findings are far more general in terms of their relevance to the wider skills and education field. Embedding ethical and inclusive competencies and thinking into our digital skills is fundamental to the long-term success of our cultures, societies, and economies.

The strategic aims to "use data to enhance public accountability, drive performance improvement empowering local communities to play an increased role in the design and delivery of local services" and the commitment to establish Research Data Scotland as a centre for excellence in ethical research are hugely important. They must also be supported by continued investment in public digital literacy & public education about the value of their personal data and how to protect it from exploitation.

In May 2020, BCS called for computer coding in scientific research to be professionalised and professional software development standards to be adopted for research with a critical impact on society, like health, criminal justice, and climate change. Furthermore, the underlying code should also be made open source[10]. Making code available where practicable to stimulate further innovation as identified in the digital strategy is a welcome commitment by the Scottish Government.

The commitment to develop the CivTech operation as the centre of public service innovation for national and local government, linking with SMEs and innovators is a strong step forward. It may be worth exploring how larger companies and multinationals may be able to actively contribute and add value to this initiative, rather than them being excluded by default.

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[9] https://www.bcs.org/media/3047/ethical-ai.pdf
[10] https://www.bcs.org/more/about-us/press-office/press-releases/computer-coding-in-scientific-research-must-be-professionalised-to-restore-trust-bcs/

In terms of accessibility, BCS broadly supports the call from The Health and Social Care Alliance Scotland[11] in their response[12] to this consultation, that a human rights-based approach to Scotland's Digital Strategy should be followed as a guiding principle to secure disabled people's rights. The context for inclusion, diversity and accessibility in the digital age is constantly evolving and a concerted effort is required in the areas of IT and law to make sure the legal and operating frameworks underpinning public life are fit for purpose.

Transforming Government

The success of any digital transformation led by a government must in large part be dependent on the political realities of public opinion. Delivering "digital business models that take advantage of the opportunities of digital technology" will require more than public indifference. It will, over time, require public support and understanding to justify the appropriate financing and resource required to keep pace with the world's leading economies. **We have seen many examples over recent years where decisions around data and algorithms have been made, leading to poorer outcomes for society, due to public and media pressure rooted in a lack of understanding and fear of the unknown consequences of IT and technology.** We must work increasingly in partnership to raise public awareness of the benefits of digital transformation and technology if we are to reap the benefits.

To transform government, there must be a clear and considered strategy to inform not only the public, but also to inform and education decision makers across the board. Scottish Government has a leadership role, alongside others such as the UK Government and private industry, to communicate the value to society of getting digital technology right. This starts by getting our own houses in order, making sure there are clear pathways for ethical and moral questions to be raised, that the impacts of decisions are considered publicly and that there is a level of governance equipped with the knowledge and skills to hold Scottish Government and partners to the highest standards of ethical inquiry.

Throughout this document, we refer to professional standards and qualifications as fundamental to lifting the level of competency and skill that this strategy relies on. A step change is required both in how digital skills and knowledge are perceived, prioritised, and mainstreamed across our workforces, it is simply not enough for professional IT and digital skills and competencies to be the purview of the IT department. **Professional IT skills must be rolled out, coordinated and sustained overtime across directorates, departments, and teams.**

A Digital and Data Economy

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[11] https://www.alliance-scotland.org.uk/
[12] https://www.alliance-scotland.org.uk/wp-content/uploads/2020/12/ALLIANCE-Response-Consultation-on-the-Digital-Strategy-for-Scotland-December-2020-Final.pdf

A focus on uplifting the digital competency and capabilities of SMEs in Scotland is welcome and understandable. In the short-medium term there are numerous digital challenges faced by UK SMEs, many of which are tied to the fates of international laws on data transfer and the future trading regulations the UK establishes with its international partners.

For example, in July 2020, the decision by the Court of Justice of the European Union (ECJ) to invalidate the EU-U.S. Privacy Shield (known as Schrems2) is having an immediate and potentially long-term impact on thousands of organizations that rely on it to legally transfer data abroad for operations, customer service, communications, research and development, and human resources. For larger businesses with in-house legal teams, the Schrems2 judgement is a challenging but manageable problem of red tape. For SMEs this has the potential to be hugely problematic for organisations with sensitive data functions domiciled in the UK, at least in the short term, as they are either unaware of the legal change, or unsure of how to comply within the current legal ambiguity.

Since July BCS has been working with the BCS Law Specialist Group[13] to produce guidance notes and webinars[14] for SMEs on this very subject and the actions needed to be taken immediately. It was particularly alarming how many SMEs were not aware of the ECJ judgement or indeed its implications for their business which were both immediate and potentially disastrous. these implications remain a live consideration as experts consider the small print of exit negotiation details and specific issues such as international data transfers.

It is however hugely important that larger businesses are engaged and networked across Scottish industry. BCS members feel that in Scotland and indeed across the wider UK there is an opportunity to greater utilise the value and intellectual and social capital generated by large industry to support the development and growth of SMEs. For example, the Scottish Government commitment to develop the CivTech operation as the centre of public service innovation for national and local government, linking with SMEs and innovators is welcome, however it may be worth exploring how larger companies and multinationals may be able to actively contribute and add value to this innovation, rather than them being excluded by default.

It would also be useful to see how the Scottish Government's approach to a digital and data driven economy complements UK and other devolved nations' strategies in this area such as the UK Government's National Data Strategy[15] to ensure the highest possible alignment and complementary innovations. An example of how partners across the UK develop what is meant in practice by the central pillar of 'Responsible Data' can be found in the UK Government's National Data Strategy. Currently 'responsible data' conflates three vitally important areas that we consider should be separated out into three pillars to ensure they are given suitable prominence when the strategy is executed in practice. The Scottish Digital Strategy would benefit from looking at responsible data along these three pillars:

- Building public trust in data driven services,

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[13] https://www.bcs.org/membership/member-communities/law-specialist-group/
[14] https://www.bcs.org/events/2020/july/webinar-the-morning-after-schrems-ii-decision-a-bcs-law-sg-study-group/
[15] https://www.gov.uk/government/publications/uk-national-data-strategy/national-data-strategy

- Ensuring data is always used responsibly, and
- Developing a sufficient supply of competent, ethical, and accountable computing[16] professionals across all sectors of the economy

A Vibrant Tech Sector

The BCS enthusiastically welcomes the conclusions of the 2020 Logan Review[17], especially the conclusions around diversifying and expanding computing and digital education and training. It is vitally important that internationally recognised and independently verified professional qualifications and standards in the IT and digital industries are implemented as part of the Review's commitment to establishing a vibrant tech sector. Internationally recognised standards are a vital tool in times of geopolitical uncertainty to verify quality, reliability, and performance against internationally recognised benchmarks.

An Ethical Digital Nation

BCS welcomes the commitments to an ethical digital nation as identified in this document and looks forward to seeing extra detail about the way an ethical approach is to be established and governed. As the UK's professional body for IT, we believe that ethics must be built into a strategy by design, and for the Scottish Government to achieve its ambitions of establishing an ethical digital nation, it must be bold and clear in its arrangements for ethical oversight, accountability, and governance.

In the area of digital and data ethics, governments, organisations, and civil society are in many areas operating behind the curve and speed of technological advance. The need for effective oversight, accountability, and governance is acute and should be developed in collaboration with other partners both in the UK and internationally. The recommendations of Doteveryone's Regulating for Responsible Tech Report[18] demonstrate a clear path for the UK Government to "hold technology to account; to inform the public and policymakers with robust evidence on the impacts of technology; and to support people to seek redress from technology-driven harms" and there are opportunities here for the Scottish Government to deliver on some of these recommendations in meaningful and impactful ways.

The huge benefits of delivering a 'digital nation' must be supported by innovation and bold developments in ethical oversight, accountability, and governance. We look forward to seeing further detail on these arrangements and are willing to help and support in any way we can.

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[16] we take computing to be a catch all term covering computer science, digital technologies, data science, artificial intelligence, machine learning and cyber security
[17] https://www.gov.scot/publications/scottish-technology-ecosystem-review/
[18] https://www.doteveryone.org.uk/wp-content/uploads/2018/10/Doteveryone-Regulating-for-Responsible-Tech-Report.pdf

5. Are any of the potential actions more important than others?

Yes.

Given the potential impact of digital technologies such as AI and machine learning on so much of the modern world, it is essential that all practitioners have the competencies and professional qualifications and standards necessary to ethically design, ethically develop, ethically deploy, ethically manage, and ethically maintain AI and machine learning products and services. Significant stakeholders such as the Scottish Government as part of Scotland's AI strategy[19] should consult on and identify mechanisms for encouraging the embedding of an 'ethical by design' approach within curricula, as part of a range of incentives for the adoption of this approach across education and training.

BCS would welcome engagement with the Scottish Government on the ethical foundations to this digital strategy; BCS has been working with the UK Government's independent advisory body, the Centre for Data Ethics and Innovation (CDEI) [20] on developing practical guidance on embedding ethical practice in MSc courses on Machine Learning and Data Science[21] and in other areas of computer science. BCS also convenes the ICT Ethics specialist group[22] and we are keen to share our learning and insights on the ethics of computing and digital technologies.

6. How realistic do you think it will be to deliver these potential actions?

Please explain why:

This is a challenging and ambitious plan which will require significant collaboration and engagement at inter and intra-governmental level and across corporate, academic, public and third sectors, linking to effective community, sector, and professional networks.

The effective coordination of this is fundamental with clearly demarcated roles and responsibilities. Fundamental functions such as accountability, oversight, and governance in areas such as ethics and inclusion should be considered and established as a priority alongside a clear and ongoing impact assessment on inclusion, equality and access in order to identify concerns and barriers early.

7. Is there anything else you wish to comment on that has not been covered elsewhere?

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[19] https://www.scotlandaistrategy.com/
[20] https://www.gov.uk/government/organisations/centre-for-data-ethics-and-innovation
[21] https://www.bcs.org/content-hub/cdei-and-bcs-study-into-ethical-maturity-of-ai-practice/
[22] https://www.bcs.org/membership/member-communities/ict-ethics-specialist-group/

Although inclusion is covered within the strategy, there is a clear opportunity here to address some of the fundamental inequalities in the digital industries. Latest data on the proportion of women in IT shows a slow increase, women account for just 20% of the industry according the BCS' latest analysis - rising from 17% at the same point in 2019. We know that in times of pressure and challenge, those with the least power and agency in society are often impacted most negatively. Black women are severely under-represented in IT and make up just 0.7% of the IT sector. Their representation is 2.5 times worse than for other industries, according to BCS analysis[23].

The impact of Covid-19 on our industry has been no different. We have seen that most of the additional pressure from home working such as home schooling and caring responsibilities have fallen to women in family dynamics, having a negative cumulative impact on women's capacity in 2020. The impacts of these are yet to be seen in statistics.

Covid-19 has not necessarily changed the nature of this discrimination but it sure to have made the situation more challenging for those already burdened with barriers to access. Scotland has thriving civil institutions and community engagement and is well placed to reassert equality, inclusion and access at the heart of this digital strategy.

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[23]https://www.bcs.org/more/about-us/press-office/press-releases/record-numbers-of-women-in-it-but-black-women-still-under-represented-new-research-finds/