

Final version



Data – A New Direction BCS Response

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BCS

The Chartered Institute for IT

3 Newbridge House,

Newbridge Square,

Swindon SN1 1BY

BCS is a registered charity: No 292786

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Executive Summary

This document is the BCS response to the UK government consultation¹ ‘Data: a new Direction’, which is a synthesis of BCS expert professional members’ opinions. BCS welcomes the government’s focus in the consultation on the role of data regulation and regulators in stimulating responsible innovation, productivity and growth through data driven technologies that benefit society. The consultation presents a significant opportunity to further establish the UK as a trusted global partner at the heart of responsible innovation.

Key Top-Level Feedback: For regulatory frameworks to fulfil the ambitions in the National Data Strategy², National Innovation Strategy³ and National AI Strategy⁴ they should:

- set out the underpinning principles that characterise responsible data driven innovation and how they build on the ‘responsible data’ pillar in the National Data Strategy
- include clear guidance on how regulators should support organisations develop governance that enhances their freedom and autonomy to innovate responsibly
- encourage the development and adoption of innovative digital technologies that will help organisations in (possibly international) supply chains work together responsibly.

Innovation thrives on freedom and autonomy in the pursuit of a clear purpose and vision. The BCS view is that regulation should allow organisations as much freedom and autonomy as possible to innovate, provided those organisations can demonstrate they are ethical, competent and accountable when measured against standards that are relevant to the area of innovation. Pro-innovation regulation should enable effective knowledge transfer, the sustainable deployment of new technologies, as well as stimulate organisations to embrace innovative thinking as core to their strategic vision and values. Such principals should underpin a framework of responsible innovation that is used to inform regulators and would also present an opportunity to significantly refresh expectations for pro-innovation organisational governance across whole supply chains.

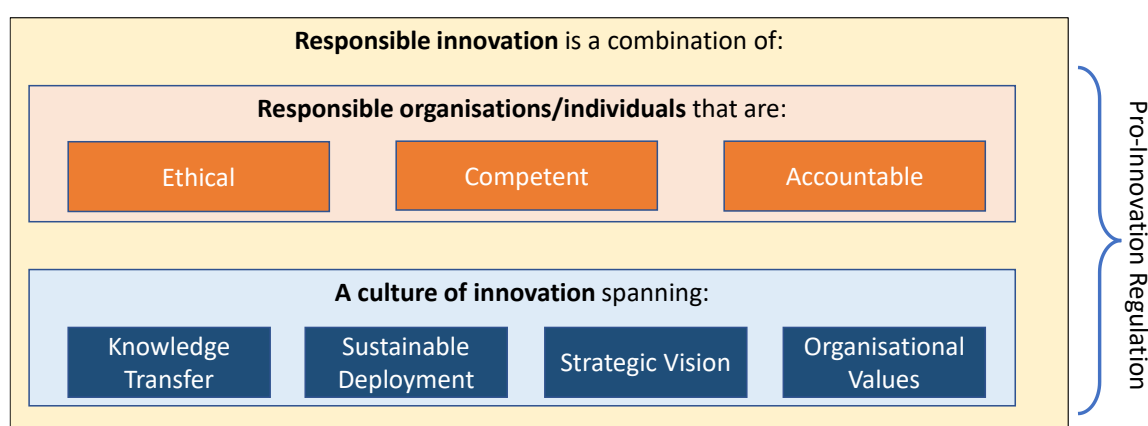


Figure 1: The role of pro-innovation regulation

¹ <https://www.gov.uk/government/consultations/data-a-new-direction>

² <https://www.gov.uk/government/publications/uk-national-data-strategy/national-data-strategy>

³ <https://www.gov.uk/government/publications/the-government-technology-innovation-strategy/the-government-technology-innovation-strategy>

⁴ <https://www.gov.uk/government/publications/national-ai-strategy>

For example, Figure 1 gives a simple graphical representation of the principles that make up responsible innovation that will also drive productivity and growth. This includes making it explicit that responsible innovation requires organisations and practitioners to behave responsibly. It also makes it clear that for organisations and practitioners to behave responsibly requires them to be ethical and competent and accountable, as part of an overarching governance structure.

The figure also emphasises that high quality digital and data driven innovation relies on developing a culture of innovation that underpins and enables:

- transferring a deep scientific knowledge of computing into organisational/business contexts (Knowledge Transfer)
- engineering data driven systems that can sustainably meet organisational/business needs (Sustainable Deployment)
- adoption of data driven technologies and maximising their value whilst ensuring they achieve outcomes aligned with an organisation's strategic vision (Strategic Vision)
- embedding innovative thinking as a core component of organisational/business values and behaviours (Organisational Values)

The idea of responsible innovation above builds on the National Data Strategy pillar of '*responsible data*', which is '*data that is handled in a way that is lawful, secure, fair, ethical, sustainable and accountable, while also supporting innovation and research*'. Ethical professional practice by definition requires practice to be lawful and fair⁵. Professional competency requires professional practice that treats data securely. This is why in Figure 1 we do not separately refer to practice that is lawful, fair or secure as they are subsumed within the principles for practice to be ethical and competent.

The above notion of responsible innovation extends the idea of responsibly handling data by requiring subsequent innovative products and services built from data to be adopted responsibly throughout supply chains, which critically must include a requirement for professional competency in addition to being ethical and accountable. This is especially relevant to the development of Machine Learning models that will be embedded in products and services in the real world, where their evaluation, maintenance and adaptation to new settings must be managed responsibly, which will be distinct from concerns around the data handling needed to create them in the first instance. See Annex 1 for illustrative examples of the distinction between responsible data and responsible innovation.

- BCS would welcome the opportunity to work with government in developing a comprehensive principled framework that achieves the aims illustrated in Figure 1.

The following sections give our detailed responses to the chapters in the consultation, with section headings taken verbatim from the headings of the consultation. Given the urgency of addressing global climate change we have also included a separate section dedicated to sustainability (see Section 6).

⁵ Which includes the need to balance the tensions that occur between different types of fairness such as fair data use, procedural fairness, and outcome fairness.

Caveat: We only give responses to those aspects of the consultation where we have obtained meaningful, objective, and independent expert feedback from professional members of BCS. Which means our response is to a selective subset of the full consultation.

1 Reducing barriers to responsible innovation

In order to accurately reflect the feedback from our professional members, we have synthesised their comments on those clauses in the consultation where they expressed an opinion. This means we have not necessarily given answers to the specific questions in the consultation.

1.1 Consultation Section - AI and Machine Learning

This section includes the BCS responses to a selection of questions from Section 1.5 AI and Machine Learning of the consultation.

BCS response to questions of AI fairness (clause 78): The mapping laid out in consultation paragraph 71 is a helpful explanation of the complex and sometimes contradictory landscape for fairness in AI as it currently exists in several legislative frameworks.

What this misses is the need to engage with all stakeholders who are likely to be *significantly affected* by an AI or Machine Learning system as to what constitutes an appropriate definition of fairness before such systems are developed. For example, the exams ‘chaos’ of 2020 when an algorithm was used to estimate students’ A-level grades resulted in the resignation⁶ of the Chair of Ofqual. That algorithm followed from an interpretation of statistical fairness that had not been tested with schools, students, or parents, and resulted in major national demonstrations and a subsequent highly public apology from the Secretary of State for Education.

In ensuring AI systems are fair also requires reproducing fair behaviour in real world settings and demonstrating that they match the behaviour exhibited in laboratory environments. The AI community have publicly acknowledged systems built and tested in the lab very frequently behave differently in real world settings^{7, 8}.

Conclusion:

- Where AI systems will be used to make life-affecting decisions about people, all stakeholders significantly affected by the system should be involved in characterising what constitutes ‘fair’. This will be an essential element in building public trust in the development and use of AI systems.
- Whether an AI system is fair or not must be subject to rigorous testing in real world circumstances and must ensure evidence for system fairness is reproducible.

BCS response to questions on how to develop a safe regulatory space for the responsible development, testing and training of AI (clause 82)

⁶ <https://www.bbc.co.uk/news/education-53909487>

⁷ <https://www.bbc.co.uk/news/education-53909487>

⁸ <https://www.bbc.co.uk/news/science-environment-47267081>

Whether it is reasonable to permit organisations to use personal data more freely, subject to appropriate safeguards, for the purpose of training and testing AI responsibly depends entirely on the extent and robustness of any safeguards.

Machine Learning is still an emerging technology in many respects. Which means training and testing of a system is likely to be ongoing even once a system is deployed. Continuous evaluation of an ML system is important due to the black box nature of most ML systems and the fact they work by probabilistic pattern matching. I.e., the outputs are the most likely based on pattern matching against existing training data. Input data in the real world is often likely to drift over time, so that regular retraining of the ML model will be needed and then retesting will be required on new data that is coherent with the current state of input data in order to demonstrate fairness is still preserved in the modified system.

This implies any safeguards will need to apply as much to the regular maintenance of ML systems as it does to any initial R&D activities. Training and testing are likely to be part of the day-to-day operational management of an ML system, which implies using data more freely for the purpose of testing and training has significant implications for the responsible operation and management of ML systems.

Conclusion:

- Any safeguards for the testing and training of Machine Learning systems must be embedded within the day-to-day operational management and governance of such systems, due to the fact deployed ML systems need regular retraining and retesting, for example due to such things as data drift.
- Due to the lack of genuine delineation between R&D compared to operational retraining and retesting of AI systems on a regular basis, it is strongly advised AI training and testing is not treated as solely for research purposes.

BCS response to questions on processing personal data for the purposes of ensuring bias monitoring, detection and correction in relation to AI systems constitutes a legitimate interest (clause 90)

Government proposes creating a limited, exhaustive list of legitimate interests for which businesses can use personal data without applying the balancing test, thereby giving organisations more confidence to process personal data without unnecessary recourse to consent.

The consultation is clear that the processing would still have to be necessary and proportionate. Government proposes to stipulate in this list that processing personal data for the purposes of ensuring bias monitoring, detection and correction in relation to AI systems constitutes a legitimate interest in the terms of Article 6(1)(f) for which the balancing test is not required.

Conclusion:

- It is necessary to include in the list of legitimate terms of the Article that processing personal data for the purposes of ensuring bias monitoring, detection and correction in relation to AI systems constitutes a legitimate interest. This is important to allow

business to increase AI trustworthiness, which in turn is essential for building public trust, and is also proposed within the EU AI Act as a modification to GDPR.

BCS response to questions on decisions based solely on automated processing (clause 100)

This section discusses the removal of Article 22 of the GDPR. Article 22 focuses specifically on the right to review fully automated decisions. Article 22 is not an easy provision to interpret and there is danger in interpreting it in isolation like many have done. There needs to be clarity on the rights someone has in the scenario where there is fully automated decision making which could have significant impact on that individual.

Before making any final decision about removal of the Article there should also be clarity on whether Article 22(1) is meant to be interpreted as a blanket prohibition of all automated data processing that fits the criteria or a more limited right to challenge a decision resulting from such processing. At present it is not apparent that either retaining Article 22 in its current form or removing it achieves such clarity.

It is important to take into account that protection of human review of fully automated decisions is currently in a piece of legislation dealing with personal data. If no personal data is involved then the protection does not apply, but the decision could still have a life-changing impact on an individual.

For example, suppose a hypothetical algorithm is created that can decide whether an individual should be vaccinated. Suppose data input required by the system does not uniquely identify the person in question, such as for example perhaps only requiring someone's age and ethnicity. In such an example and based on the input, the decision could be that an individual is not eligible for a vaccine. In this case any protections in the GDPR would not apply as there is no personal data. This example illustrates why there is a need to establish clarity around the Article.

This illustration begs the question, if we think Article 22 protection is important enough to be outside GDPR then do we need to regulate AI generally - and not through the "back door" via GDPR?

Machine Learning and AI technologies are not fully mature technologies, the professional practice around developing and deploying them is still evolving, and the main use cases for AI in industry are far from being stable. For example⁹, BCS has been clear that better quality research is needed before artificial intelligence can be trusted to diagnose breast cancer in the full range of UK patients. The AI community are also clear that a great deal of care should be exercised in adopting AI systems that affect individuals.

Given this current level of maturity it is essential that individuals are able to properly contest decisions about them made by AI systems, and that appropriate mitigation and remediation is made responsibly. By definition, a fully automated algorithmic system is incapable of understanding the true impact of its decision on a human, which implies they

⁹ <https://www.bcs.org/articles-opinion-and-research/ai-breast-screening-needs-stronger-evidence-before-it-is-safe-for-clinical-use/>

are incapable of being truly responsible and means humans must be in the decision-making loop in a meaningful way until AI and particularly professional practice concerning AI has fully matured.

Conclusion:

- The right to human review of decisions made fully by computers should not be removed while AI and particularly Machine Learning are an emerging series of technologies that have not reached maturity.
- Products and services that have embedded AI don't always involve personal data to make decisions about us. Hence, true protection of our right to revisit must consider wider regulation of AI beyond responsible handling of data.

2 Reducing burdens on businesses and delivering better outcomes for people

As with the previous section, in order to accurately reflect the feedback from our professional members we have synthesised their comments on those clauses in the consultation where they expressed an opinion. This means we have not necessarily given answers to the specific questions in the consultation.

2.1 Consultation Section - Reform of the Accountability Framework

BCS response to questions on the proposal to remove the requirement for organisations to undertake a data protection impact assessment (Clause 167)

Government proposes to remove the requirement for organisations to undertake a data protection impact assessment (DPIA), so that organisations may adopt different approaches to identify and minimise data protection risks that better reflect their specific circumstances.

The proposals to replace DPIAs with other types of mechanism do not seem to provide any benefits beyond those already provided by DPIAs. DPIAs are well-defined and widely adopted. The cost benefit in the proposals identifies savings on legal advisors, but it is unclear that other types of mechanism would not also require legal advisors.

Conclusion:

- DPIAs are in wide use and well understood, and as there seems to be no overwhelming call from practitioners for their removal they should be kept.

3 Boosting trade and reducing barriers to data flows

As with the previous section, in order to accurately reflect the feedback from our professional members we have synthesised their comments on those clauses in the consultation where they expressed an opinion. This means we have not necessarily given answers to the specific questions in the consultation.

3.1 Consultation Section – Adequacy

BCS response to questions on alternative transfer mechanisms (Clause 265)

UK business has recently incurred significant costs dealing with the impact of the EU-US Privacy Shield¹⁰ falling away^{11, 12}. Should the consultation proposals result in the UK losing its adequacy status with the EU then the financial impact on business will remove any benefits outlined by the proposals and likely have far reaching consequences for businesses.

Within the consultation there is significant discussion of the possibility of new transfer mechanisms that allow the newly agreed Adequacy agreement¹³ with the EU to stay in place. However, it is quite clear from the European Data Protection Board¹⁴ (EDPB) guidance in 2020 that the contractual and governance elements within an Adequacy agreement cannot be relied upon if the country allows its own legal system to override them. In such circumstances, the EDPB stipulates the need for appropriate supplementary technical measures¹⁵.

Conclusion:

- The consultation does not consider the implications of EDPB guidance on supplementary technical measures and what specific measures need to be in place if they are required, should contractual and governance elements of an Adequacy agreement no longer be deemed to be sufficient. This is a significant gap in the consultation that must be addressed with urgency.

BCS response to questions on proposed modifications to the framework for certification schemes (Clauses 266, 267, 268)

The government is considering modifications to the framework for certification schemes to provide for a more globally interoperable market-driven system that better supports the use of certifications as an alternative transfer mechanism. Government is considering provisions that clarify that prospective certification bodies outside of the UK can be accredited to run UK approved international transfer schemes. The government will encourage existing international schemes to engage with UK standards and bodies in other countries to develop UK compliant schemes to support friction-free data flows with UK businesses.

¹⁰ <https://www.privacyshield.gov/welcome>

¹¹ <https://www.bcs.org/more/about-us/press-office/press-releases/challenges-set-by-schrems-2-personal-data-ruling-won-t-go-away-after-brex-it-institute-for-it-warns/>

¹² <https://www.nytimes.com/2020/07/16/business/eu-data-transfer-pact-rejected.html>

¹³ <https://www.gov.uk/government/news/eu-adopts-adequacy-decisions-allowing-data-to-continue-flowing-freely-to-the-uk>

¹⁴ https://edpb.europa.eu/edpb_en

¹⁵ https://edpb.europa.eu/system/files/2021-06/edpb_recommendations_202001vo.2.0_supplementarymeasurestransferstools_en.pdf

Conclusion:

- Under these proposals businesses that are data processors that have to navigate Data Processing due diligence from every client could potentially achieve a significant cost saving.
- The proposals reduce the need for legal expertise and ICO enforcement.
- Clarification is needed concerning how these proposals will help transferring data to countries that do not have an Adequacy agreement, as generally speaking, the government of these countries can intervene however they choose at a later date, which would contravene EU principles of data transfer.

4 Delivering better public services

As with the previous section, in order to accurately reflect the feedback from our professional members we have synthesised their comments on those clauses in the consultation where they expressed an opinion. This means we have not necessarily given answers to the specific questions in the consultation.

4.1 Consultation Section - Building Trust and Transparency

BCS response to questions on compulsory transparency reporting of algorithms in decision making (Clause 290)

The government proposes introducing compulsory transparency reporting on the use of algorithms in decision-making for public authorities, government departments and government contractors using public data.

Conclusion:

- This would be of fundamental significance in building public trust, and is essential in ensuring public services adhere to the Nolan Principles as they apply to algorithms¹⁶

5 Reform of the Information Commissioner's Office

As with the previous section, in order to accurately reflect the feedback from our professional members we have synthesised their comments on those clauses in the consultation where they expressed an opinion. This means we have not necessarily given answers to the specific questions in the consultation.

Beyond the findings we reported in the Executive Summary the following points cover the other opinions that were received in feedback to the consultation.

Conclusion:

- The ICO needs to remain independent to be effective and credible
- The ICO must be properly resourced to comply with its statutory duties

¹⁶ <https://cspl.blog.gov.uk/2020/08/19/decision-making-by-algorithm-must-meet-nolans-tests/>

- The ICO must be sufficiently staffed to have the capacity and capabilities necessary to deal with the additional expectations placed on it to support responsible innovation

6 Sustainability

It is critical that all government policies reference the need for global decarbonisation, and how the policy will support that outcome.

According to The Royal Society's 2020 report¹⁷, Digital technology and the planet: Harnessing computing, *"to achieve net zero nearly a third of the 50 per cent carbon emissions reductions the UK needs to make by 2030 could be achieved through existing digital technology"*. For that to happen, it will require globally harmonised digital standards to ensure high quality data and professional practice is established across the globe.

As current Chair of the G7 and host of the COP26 summit, the UK is in a unique position to lead the global efforts towards a green and sustainable future. The UK should work with regulators from all governments participating in both the G7, the G20 and COP26 to seize this unique opportunity for international collaboration to make visible and tangible commitments to Green IT and responsible computing both at home and internationally through appropriate internationally aligned regulatory frameworks. This should be a priority objective in the Digital Regulation Plan.

Annex 1. Responsible innovation and responsible data handling are different

This annex includes three hypothetical examples to illustrate how responsible data handling is not necessarily the same as responsible innovation.

Hypothetical Example: Social media platform amplifying legal but harmful content

Consider the example of a social media platform that conducts research into whether the core engagement algorithms of the platform are magnifying and facilitating legal but harmful content. The research identifies it is true that the core algorithm amplifies such content. At every stage of the research the data is responsibly gathered, stored, processed and shared by the company. That is the data for the research is entirely handled responsibly. After the report is reviewed it is shelved and no further action is taken.

This is a hypothetical example where data itself is handled responsibly, but the company failed to act on the research findings and innovate responsibly by redesigning the core engagement mechanisms to reduce harmful content. A regulatory framework that required greater openness and transparency around data driven R&D may have stimulated the right kind of innovation in this example. The forthcoming Online Safety Bill is expected to deal with issues such as these, and in many ways can be seen as an attempt to force companies to be more innovative about developing technologies that enhance their ability to act responsibly.

¹⁷ <https://royalsociety.org/topics-policy/projects/digital-technology-and-the-planet/>

Hypothetical Example: CV filtering software responsibly redesigned to help upskill people

For this example consider a recruitment agency that has developed an AI agent that can filter CVs based on employer's skills requirements. Essentially this is used to automatically reject applications for jobs that do not meet the skills needed to do the job. Assume all data is handled responsibly so that applicants are fairly treated, can contest decisions properly when they feel something has gone wrong, and are not in any way discriminated against.

The company realises that with all the data it possess it can provide meaningful insight into job applicants' skills gaps. Based on this insight it redevelops its AI agent, without the need to gather or process any new data, to advise failed job applicants on ways of upskilling to successfully apply for better jobs in the future.

This is an example of responsible innovation that goes beyond and is distinct from responsibly handling data. The company has identified how it can expand its core business through responsible innovation in ways that provide societal benefit by helping people upskill to get better jobs, whilst still serving their core employer audience and without changing the regulatory requirements concerning data they collect. They have responsibly developed their business model to create an innovative service that benefits society, and which will lead to significant growth for the company, whilst the core data handling itself has not significantly changed.

This is an example where regulators would have an important role in helping a company enhance its governance structures to allow the kind of freedom and autonomy necessary to innovate in this way.

Hypothetical Example: responsibly innovating to reduce carbon emissions

For this example suppose a company develops an AI product to help civic authorities minimise traffic congestion, and hence reduce carbon emissions from traffic. Suppose the AI is used to adjust, minute by minute, location based congestion charging through analysis of real-time car telemetry data generated by internet connected sensors embedded in vehicles. Suppose none of this data relates to individuals nor can it be traced back to individuals. In which case current data handling regulations concerning individuals, such as GDPR, would not apply.

This an example of responsible data driven innovation leading to societal benefit, which although does not collect personal data does collect data generated by individual's personal property (i.e. their cars). In this case pro-innovation regulation would need to be clear as to when it is reasonable for civic authorities to access this type of data and for what purposes.

Annex 2. Public Trust Survey

The government's analysis¹⁸ of the impact of the proposed reforms quotes a number of surveys of public trust in the use of data. These are somewhat contradictory to the YouGov surveys commissioned by BCS in 2020. Given the disparities between these surveys it is important to include the results of the BCS surveys in this response. BCS commissioned YouGov to conduct two surveys of representative samples of the UK adult population across all devolved nations to find out how badly public trust in information technologies, such as for example AI, had been eroded.

The headline results from those surveys were:

- Over half (53%) of UK adults have **no faith** in any organisation to use algorithms when making judgements about them¹⁹, in issues ranging from education to welfare decisions.
- 63% of UK adults **disagree** with the statement "*Students graduating with a computer science university degree are qualified to write software that makes life decisions about people*"
- 62% of UK adults believe someone who for a living develops computer software that can significantly affect people's lives should be qualified as a government-approved **Chartered professional**

The following lists the detailed questions and responses from those surveys.

Question: Which, if any, of the following organisations do you trust to use algorithms to make decisions about you personally:

Base: All UK adults	2076
The Government	10%
Social media companies (e.g. Facebook, Instagram etc.)	8%
'Big Tech' companies (e.g., Apple, Google etc.)	11%
Financial services (e.g. banks, insurance companies etc.)	16%
Health and social care (e.g., the NHS, private health care, the council etc.)	17%
Armed Forces	7%
The education sector	7%
The police	11%
Social Services	7%
National Security and Intelligence services	12%
Housing associations	6%
Other	1%
Don't know	16%
I do not trust any organisations to use algorithms to make decisions about me	53%

¹⁸

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1016471/Data_Reform_Impact_Analysis_Paper.pdf

¹⁹ <https://www.bcs.org/more/about-us/press-office/press-releases/the-public-dont-trust-computer-algorithms-to-make-decisions-about-them-survey-finds/>

Question: Who, if anyone, do you think should be responsible for ensuring that digital technology is used to solve ethical issues?

Base: All UK adults	2063
Politicians	22%
Universities	18%
Technology companies (e.g., Apple, Google etc.)	23%
An independent regulating body	59%
The individual computer programmer	13%
Other	3%
Don't know	13%
I do not think anyone should have responsibility for this	14%

Question: To what extent do you agree or disagree with the following statement?
 "Students graduating with a computer science university degree are qualified to write software that makes life decisions about people"

Base: All UK adults	2063
Strongly agree	2%
Tend to agree	16%
Tend to disagree	32%
Strongly disagree	31%
Don't know	19%
Net: Agree	18%
Net: Disagree	63%

Question: To what extent do you agree or disagree with the following statement:
 "Someone who develops computer software for a living that can significantly affect people's lives, should be qualified as a government-approved Chartered professional"

Base: All UK adults	2063
Strongly agree	22%
Tend to agree	40%
Tend to disagree	11%
Strongly disagree	6%
Don't know	21%
Net: Agree	62%
Net: Disagree	17%

Annex 3. Who we are

BCS is the UK's 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 over 55,000 members including practitioners, businesses, academics and students, in the UK and internationally.

We also accredit the computing degree courses in over ninety universities around the UK. As a leading IT qualification body, we offer a range of widely recognised professional and end-user qualifications.