# Welsh Government Digital Ethics Report

*Applying digital ethics to government and public services*

Prof. Andrew McStay (Emotional AI Lab, Bangor University)
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For Welsh Government
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THE EMOTIONAL AI LAB

INTERNET OF THINGS PRIVACY FORUM

PRIFYSGOL BANGOR UNIVERSITY

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## EXECUTIVE SUMMARY AND RECOMMENDATIONS

The Chief Digital Officer of the Welsh government is in an ideal position to become a point of expertise on the ethical design and use of public sector technology projects in Wales. Under the heading of 'Digital Well-being,' the Chief Digital Officer can align a general mandate to do digital and data ethics within Wales with the legal and moral imperatives of the Well-being of Future Generations (Wales) Act 2015. This Act, however, is 'missing' any significant reference to technology and its interaction with society. Nonetheless, in conjunction with its moral antecedent, the UN Sustainability Development Goals, it provides a clear set of norms and values by which to ethically guide technology projects being developed and launched by Welsh public bodies and Local Councils. This report distils those norms and values into a set of technology governance imperatives and practical guidance for the Chief Digital Officer to use in its interactions with public bodies, Welsh Ministers, and the Future Generations Commissioner.

We recommend:

- Seeing the Well-being of Future Generations Act as the 'moral North Star' for doing digital ethics in Wales.
- Including the UN Sustainability Development Goals as core elements of the norms and values guiding Welsh digital ethics.
- Using the Precautionary Principle to help guide approaches to technology governance.
- Using the idea of 'Digital Well-being' to align technology ethics and governance with existing Welsh political discourse.
- The Chief Digital Officer becoming a key source of expertise to address the 'missing piece' of the Future Generations Act, directly helping the Welsh Ministers, the Future Generations Commissioner, and the Auditor General to add digital technology considerations to their well-being development activities.
- Developing a generalized approach to addressing the particular and technology-specific questions the Chief Digital Officer is fielding.
- Using digital ethics to consider the powers granted under the UK Digital Economy Act.

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## THE FOCUS AND STRUCTURE OF THIS REPORT

Funded as a "Sprint" project for the Welsh Data Nation Accelerator (WDNA), the purpose of this report is to help the Welsh government and it's Chief Digital Officer assess and guide public sector technology projects towards ethically sound positions. It proposes the concept of **'digital well-being'** as an ethical framing, thereby aligning reviews of Welsh public bodies' projects with the Well-being for Future Generations (Wales) Act. The report is structured as follows: a primer on ethics and digital ethics; 'digital well-being' as a useful framing for Wales; analysis of the norms and values of the Well-being for Future Generations Act, the UN sustainability development goals and the Precautionary Principle; distillation of those norms and values into technology governance imperatives for project guidance; practical activities to maximise national well-being goals; a review of a survey of nationally segmented British attitudes toward government use of technology and personal data; and a set of resources to further explore digital ethics and well-being.

## AN ETHICS PRIMER

### *What are ethics?*

Overall, ethics are sets of behaviours that define a society. They entail codes that internally guide the conduct of a given society or other organisation of interest[1] and are dependent on the socio-cultural context from which they emerge.[2] In relation to technology, this means that any normative assessment will likely draw upon existing laws, court decisions, 'common sense' and the prevailing norms associated with the politics of a given society (e.g., liberal values, or the primacy of a free market).

From the broadest perspective to focusing on highly specific questions, the study of ethics distils to:

- *Meta-ethics*: the theoretical meaning and reference of moral propositions, and how their truth values (if any) can be determined.
- *Normative ethics*: the practical means of determining a moral course of action.
- *Applied ethics*: what a person is obligated (or permitted) to do in a specific situation or a particular domain of action.

[1] Bryson, J.J. 2018. Patiency is not a virtue: the design of intelligent systems and systems of ethics, *Ethics and Information Technology, 20*(1):15–26.

[2] Turiel, E. (2002). The culture of morality: Social development, context, and conflict. Cambridge: Cambridge University Press.

In this report we focus on the latter two, normative and applied, as they are best suited to analyse the thorny ethical questions that arise from government use of technology and personal data.

## *Normative ethics*

General approaches to ethics differ, and while they are all broadly aimed at producing "good" outcomes, they have different and sometimes contradictory ways of doing this – ethics does not involve a single set of rules. The three main normative ethical 'schools' are *virtue ethics*, *consequentialist ethics*, and *deontological or duty-based ethics*.

| Ethics type | Virtue ethics | Consequentialist ethics | Deontological or duty-based ethics |
|---|---|---|---|
| Single word description | Integrity | Outcomes | Principles |
| Expanded description | An approach based on character, where the right act is the action that one believes a virtuous person would do in the same circumstances. | Where the best moral choice is the one with the best overall consequences in any given moment. | Follows and will stick to rationally established principles to justify an action or decision. |
| Focus | Motive and the character of the decision-maker. | To maximise good and happiness. | Establishing principles of right and wrong, and that being human has innate value. |
| Type of choice | Asks what a would a truly virtuous person do in the same circumstance. | Asks what would make most people happy/save most lives. | Asks what moral rules apply and what duties should be followed, potentially even if it leads to a bad consequence. |

'Normative' ethics are important in the present context because they establish guidance and means of evaluating conduct and questions. With the Well-being of Future Generations Act being a highly moral piece of law, the practicality of digital policy is guided by normative considerations. The Act's basic principles are built on pro-social enlightenment values of sustainability, keen awareness of cultural life, wellbeing, opportunity, equality, intra-connection (of communities), and being a responsible 'citizen of the world.'

## *Applied ethics*

Applied ethics tries to give answers to practical moral questions. Well-known moral struggles include abortion, animal rights, and environmentalism. Increasingly, technology's effects on society are a contentious moral topic. The normative aspect of ethics is important, but the day-to-day business of doing public policy involves ethics of an applied sort. The difference is that normative approaches may be unwieldly in answering practical questions. In these cases, theory and values are a starting point, but they will be supplanted by prior experience with similar cases, empirical data, organizational experience, and other mitigating interests (that may or not be of a moral sort), e.g., budgets, departmental pressures, Ministerial pressures, journalist interest, or citizen demands. This, however, does not mean normative and applied approaches are separate, because values help guide and orient conduct and decision-making, acting as the background to evaluate decisions against. Values or 'norms may help because they act as a point of orientation. As developed below, the Well-being for Future Generations Act is useful in this regard, not just for political strategy, but to provide a moral compass.

## *Digital ethics*

One prominent scholar defines digital ethics as:

> '[…] the branch of ethics that studies and evaluates moral problems relating to data and information (including generation, recording, curation, processing, dissemination, sharing and use), algorithms (including AI, artificial agents, machine learning and robots) and corresponding practices and infrastructures (including responsible innovation, programming, hacking, professional codes and standards), in order to formulate and support morally good solutions (e.g. good conduct or good values). Digital ethics shapes digital regulation and digital governance through the relation of moral evaluation.' [3]

Put a slightly different way, digital ethics is the task of identifying 'what a good and fair society is, what a meaningful human life is, and what the role of technology is and could be in relation to these.'[4] For Wales, we argue that the Well-being of Future Generations Act and UN SDGs provide both politically expedient and otherwise excellent moral backdrop for digital ethics in Wales. Future considerations of other digital ethics frameworks, such as the German Data Ethics Commission or the European Commission Ethics Guidelines for Trustworthy

[3] Floridi, L. et al. 2018. Soft Ethics and the Governance of the Digital, Philosophy & Technology, 31:1–8.
[4] Coeckelbergh, M. (2020) AI Ethics. MIT Press. P.142.

Artificial Intelligence, can broaden the moral basis for digital ethics analyses going forward.

### *Distinguishing data protection rules from digital ethics*

Under Article 8 of the EU Charter of Fundamental Rights citizens have a right to the protection of their personal data. That right is a *fundamental right*, alongside freedom of thought, the right to free expression, equality before the law, and the right to fair working conditions, among many others. Fundamental rights are normative, deontological rules used to broadly govern society. Data protection laws, such as the UK General Data Protection Regulation (GDPR), are practical enactments of the underlying fundamental right to the protection of personal data.[5] They specify a range of principles – such as lawfulness, fairness, transparency and accuracy – which in turn are distilled into individual rights, such as the right to access or correct data about oneself; responsibilities for data controllers and their vendors; requirements to obtain consent; rules for international transfers of personal data; requirements for secure handling; and so on. In other words, data protection laws are highly prescriptive instruments for guiding the conduct of entities who collect, process, and share personal data.

Digital ethics is less prescriptive, as it is the normative orientation and values relating to digital technologies believed to create or be part of a good society. Ethics, certainly for us, are about reflecting and doing, rather than adherence. Digital ethics guide and inform data protection rules, but they are not synonymous, especially when what is allowed by data protection is not commensurate with values regarding what is believed to be allowable behaviour in a good society. Hence, **a technology or type of data processing may be legal but still unethical.** This does not make its applicable data protection policy 'unethical' – rather, it reflects the inherent limitations of regulation. That is, regulations are legislative moments 'frozen in time'; negotiated settlements of a range of highly complex issues, many of them moral and socio-political. While data protection laws attempt to be technology-neutral and flexible, that flexibility is limited by the knowledge that existed at the time of their drafting. Further, there are many issues where court oversight is required as a law may be inexact or inapt for a given application. And, ethics and morality are 'contested terrain,' whereas data protection rules fit within a larger mandate to regulate but fundamentally enable the flow of personal data.

[5] The UK GDPR is de-coupled from the EU Charter because of Brexit, but it still currently behaves as if it had the same rights-based underpinning.

## *How to do digital ethics?*

Digital ethics may feel overwhelming, especially when trying to tackle technical problems with numerous facets through use of macro-level principles. Thankfully, there are a range of techniques, critical approaches, and methods to help do digital ethics. Especially for policy-based work, it is first useful to assess by 'levels,'[6] including *technology, artifact,* and *application*, which is helpful because it helps identify the problem and where specific concerns lay. 'Levels' include

- The *technology* level: a particular technology is defined independent of artifacts or applications that may result from it (e.g., AI).
- The *artifact* level: where functional artifacts, systems and procedures are developed (e.g., use of machine learning to simulate understanding of emotion)
- The *application* level: focusing on ways of using an artifact or procedure, or on ways of configuring it for use (e.g., use of emotion recognition to gauge reactions to new products).

Applied, the value of this is that it avoids impossible to answer questions, such as "Is AI ethical?" because often the question is about highly specific parts of AI technologies (such as computer vision or machine learning), which are embedded in objects and processes, and then these are applied in the real world, potentially with people. In practice, most digital ethics questions are about the artifact and application stages, e.g., is training data suitably transparent and socially representative (artifact), and should shops be scanning facial expressions through shelf-level cameras (application). In the section below, Putting the Hot Button Issues in Context, we approach the questions that the Chief Digital Officer is receiving from the perspectives of artifacts and application.

Another approach is *harm and evaluation*. Harms may be relatively generic (such as privacy) or quite specific to the technology (such as discrimination through inadequately curated training data sets for computer vision applications). In general, harms questions involve intended and unintended consequences. Having identified harms, the next task is to evaluate. Key questions for evaluation are:

- The extent to which the technology will become significant for society.
- The extent and reach of the harm.
- Positive dimensions of allowing such a violation? Who benefits and is this of social benefit?

[6] Brey, P. (2012) Anticipating ethical issues in emerging IT, *Ethics and Information Technology*, *14*(4):305–317.

Other related routes for ethical assessment may involve[7]:

- Formal understanding of the nature and uses of a given technology (i.e., what, whom, where and why) and the ethical issues that flow from this (such as decisional bias or privacy).
- Environmental scanning and making ethical judgements in relation to identified factors, such as political values and public policy (with the Well-being of Future Generations Act being key for Welsh Government), demography, and economic factors*
- Impact on named social groups (especially the vulnerable) *
- Maturity of the technology
- Soliciting expert insight to help with judgements*
- Simulating scenarios and possible futures where decisions are made one way or the other
- Selection of best possible futures out of multiple options
- Assessments based on known or potential applications of a technology
- Expert or citizen surveys, for longer term decisions
- Time series analysis (drawing insights from data over time)

To evaluate the various types of Welsh public sector technology projects, we view the methods starred with an asterisk as the most promising for initial appraisals.

## *Explainability*

Whichever approach to digital ethics is used, we also suggest that ethical decisions should be explainable. In context of ethics, explainability 'refers to the ability to explain to others why you have done something or why you have made a decision; this is part of what it means to be responsible.'[8] For Welsh digital ethics, a minimum requirement is that the ethical basis of whether to do something or not is explainable to relevant stakeholders (be this Ministers or the public). This includes things like values and principles, but also other factors which are likely present when trying make applied ethical decisions.

There are two key elements that make for good explainable ethics:

1) Transparency of decision-making to enable assessment.
2) That, in context of constraints, a variety of ethical positions and other pressures have been considered, rejected, and accepted.

[7] Ibid.
[8] Coeckelbergh, M. (2020). *AI Ethics.* MIT Press. p. 204.

*Encouraging debate*

With ethics being about doing rather than adherence, the role of ethics is less about final "correct" answers than making judgements with balanced different ethical values. A forum that draws a plurality of expertise and backgrounds (policy delivery, ethical, legal, technical, and lay citizen) is valuable in this regard as regular conversation among various stakeholders helps identifies errors in thought and principle. We acknowledge that consensus is frequently hard to establish, especially so when good principles may compete for priority among a set of political differences. A forum in which to air differences can establish a functioning and respectful balance among a plurality of actors. It could also raise the quality of conversation regarding ethics, technology, and delivery of public services and support for Welsh innovation. Again, the benefit is that critical problems are surfaced and, in many cases, addressed in an ongoing, open process.

*Ethics supports the pursuit of 'digital well-being'*

Given the desire to approach Welsh public technology projects from an ethical stance, one must 'localize' that approach to Wales. The following sections specifically address how local norms – in the form of the Well-being of Future Generations Act and its antecedents – can have direct application to technology guidance imperatives. But, additionally, discourse matters: how the Chief Digital Officer talks about their efforts affects how those efforts are perceived and supported. The word "ethics" and its attendant conceptual language can be opaque and scary – the meanings are rarely immediately obvious to non-academics. We therefore suggest that internal and external discussions of the pursuit of ethical technology be framed instead as **the pursuit of 'digital well-being.'** Not only does this term have roots in classical ethics, since well-being is a common fundamental value, but, importantly, it aligns with existing Welsh political and legislative language. The Well-being of Future Generations Act is very ambitious and attempts to 'morally harmonise' Welsh governing norms. We believe that *reframing the intention to do digital ethics as one to realise digital well-being will eliminate the cognitive burdens of explaining much of ethics* and make it easy for other parts of government to accept and integrate the advice of the Chief Digital Officer for the Welsh Government.

In the previous sections we introduced key ethical perspectives. There are more, but those cited serve to highlight that ethics is not a single approach. Instead, they involve different and potentially contradictory perspectives. We also separated out levels of ethics, which is important for those working in policy development or enforcement because ethics will be mostly of the *applied* sort. In context of digital ethics, we also suggested specific questions and means of understanding problems. Finally, we noted that decisions should be explainable to relevant stakeholders.

In this section, we explore the application of ethics to public sector technology projects in Wales. Our approach of ethical technology guidance can be visualised by a set of 'nested' concepts:


Below, we argue for using the Well-being of Future Generations Act, the UN Sustainability Development Goals and the Precautionary Principle as the norms and values to inform a range of technology governance imperatives. These can then guide practical ways of analysing and fielding questions from Welsh public agencies about the social and ethical dimensions of their technology projects.

## *Well-being and technology: Norms and values*

A critical step in creating an ethical framework is the selection of the norms and values that underpin ethical analyses and decisions. Such values can be general, like 'support for human flourishing,' and others can be more specific, like 'ensuring that historically marginalized communities are focused on.' Fortunately for Wales, a framework for norms and values exists: the Well-being for Future Generations Act (hereafter WBFGA). Unique by being an explicitly 'moral law,' it notably draws on United Nations' Sustainability Development Goals (SDGs) to articulate a moral point of orientation for development and policymaking in Wales.

However, the WBFGA is notably silent on digital technology issues and challenges at the intersection of technology and society. We see this as creating an excellent opportunity for the Chief Digital Officer to lead an effort *to align an ethical technology mandate with the power of an existing legal mandate*. By leading on this alignment, the Chief Digital Officer can affect and interact with discourse and application of the WBFGA in Wales.

Consequently, this part of the report attempts to introduce the 'missing piece' of WBFGA. If developed, the Chief Digital Officer may provide thought leadership to support key actors in Government, not least:

- The *Future Generations Commissioner*, who is tasked with taking an expansive, activist view of the Act, and is required to report on its progress.
- *Welsh Ministers*, who are required to create a set of national indicators that measure progress towards the well-being goals of the Act, as well as publish a report that predicts likely future trends in the economic, environmental and social well-being of Wales, taking into account the United Nations SDG activities.
- The *Welsh Auditor General*, who is required to assess and report on how public bodies have taken steps towards well-being objectives.

Translating the UN SDGs into Welsh law, the WBFGA draws upon its conception of the 'sustainability principle,' and so we believe that anchoring Welsh public sector technology ethics in the WBFGA necessitates the inclusion of UN SDG discourse and thinking about technology. In essence this requires going back up a level from the WBFGA to the UN SDGs (and related UN policy on AI and technology ethics) and retuning to the Welsh 'application layer' to suggest how international recommendations on technology ethics may apply to public services and the technology sector in Wales. It will also provide opportunity for the Chief Digital Officer to be able to feed upwards into UN policy activity. This is not an idle thought, as The Future Generations Commissioner is already working closely with the UN, who has indicated that they are taking important cues from Wales.[9] By guiding individual agencies' technology projects towards alignment with international well-being perspectives and frameworks, the Welsh government can be a further example to the international community on critical issues at the intersection of technology innovation and their attendant social issues.

[9] Howe, S. (2021). "Wales leading the way with Future Generations Legislation – UN plans to adopt Welsh Approach", [press release], https://www.futuregenerations.wales/news/wales-leading-the-way-with-future-generations-legislation-un-plans-to-adopt-welsh-approach/

*Introducing the Precautionary Principle*

Furthermore, we believe that the Chief Digital Officer should specifically include the *Precautionary Principle* to guide its interventions for Welsh public agencies as they develop and deploy new technology. This is: 'When human activities may lead to morally unacceptable harm that is scientifically plausible but uncertain, actions shall be taken to avoid or diminish that harm'. [10] Aligning well with WBFGA and UN SDG discourse (and UNESCO), the Precautionary Principle emerges from decades of environmental law, policy, and is a governing philosophy that seeks to prevent harm even if strong proof of that harm is yet to emerge. The Welsh Environment Act embodies the Precautionary Principle in its principles of sustainable management of natural resources,[11] and the Principle is generally well-aligned with sustainability principles.

A precautionary approach to technology projects acknowledges that harm is sometimes difficult to foresee; that the promises of utility and safety today may not be as assured as imagined. Information and power asymmetry exist between creators of technology projects – governments and the private sector – and those whom the projects serve or collect data from: the public. As the long-term impacts of many digital technologies can be uncertain, we argue that using the Precautionary Principle within technology ethics practice is justified and beneficial, likely to yield practical guidance for the public sector technology projects in Wales.

The WBFGA applies a practical lens to its seven core principles through the *Five Ways of Working*, which guide how Public Bodies should achieve the seven well-being goals.[12] We see three of those Ways as particularly relevant to ethical guidance of Welsh public technology projects: ***Long Term*** (that guards against sacrificing the long-term good for short-term gain), ***Prevention*** (public bodies taking active measures and interventions to ensure future well-being), and ***Involvement*** (including all members of the community to ensure future wellbeing). In these three we see specific alignment with the Precautionary Principle.

Precaution for future generations means looking beyond the near-term gains of a technology deployment to its impacts during and past its operational life. This relates directly to the focus on *Long Term* and *Prevention* as Ways of Working. In line with that focus on prevention where there is chance of moral harm, rather than

[10] UNESCO. (2005). *The Precautionary Principle*, https://unesdoc.unesco.org/ark:/48223/pf0000139578

[11] Welsh Government. (2019). *Environmental Principles and Governance in Wales Post European Union Exit*, Report Number: WG35189, https://gov.wales/sites/default/files/consultations/2019-03/eu-exit-consultation-document_0.pdf

[12] Future Generations Commissioner for Wales. (2020). Well-being of Future Generations (Wales) Act 2015: Five Ways of Working, https://www.futuregenerations.wales/about-us/future-generations-act/

embracing the 'move fast and break things' mantra of the current technological era, we encourage a deliberative approach that does due diligence to social considerations. While critics sometimes decry such approaches as anti-innovation or luddism, a precautionary approach to technology governance raises social values to at least the level of consideration of economic imperatives, supporting a more pro-social innovation culture.

The third salient Way of Working, *Involvement*, is accomplished through broad inclusion of civil society, its representative groups, and experts, which adds additional precaution to technology governance. This provides much needed oversight and critique from people and organisations who are not involved in the development (government) or creation and deployment (private companies) of technology projects. In particular, the Chief Digital Officer and Welsh Government should (1) include the voices of historically marginalized communities in technology service design; and (2) institutionalize an Expert Council to review projects that collect data from humans and social environments. Such involvement strengthens the ethical dimensions of technology governance by fostering transparency and clarity, which in turn arm the public and its advocates with sufficient detail to identify unconsidered harms or violations of expectations.

### *Application of the UN SDGs to Wales Public Sector Technology*

The WBFGA defines Sustainable Development in Wales as: "the process of improving the economic, social, environmental and cultural well-being of Wales by taking action, in accordance with the sustainable development principle, aimed at achieving the well-being goals."[13] And, "a public body doing something 'in accordance with the sustainable development principle' means that the body must act in a manner which seeks to ensure that the needs of the present are met without compromising the ability of future generations to meet their own needs."[14] These ideas and language align with the UN Sustainability Development Goals. Further, the WBFGA specifically requires Ministers to periodically publish a future trends report and "take account of any action taken by the United Nations in relation to the UN Sustainable Development Goals and assess the potential impact of that action on the economic, social, environmental and cultural well-being of Wales."[15]

The UN SDGs are a sprawling agenda, aimed at ending poverty and hunger, ensuring healthy lives and well-being, reducing inequality, fostering safety, promoting peace, and ensuring sustainable approaches to human endeavour and

[13] Well-being of Future Generations (Wales) Act 2015, Part 2: 2

[14] Ibid., Part 2: 5

[15] Ibid., Part 2: 11

economic activity. The 2030 Agenda for Sustainable Development states: "The 17 SDGs… are integrated and indivisible and balance the three dimensions of sustainable development: the economic, social and environmental." In terms of guiding technology projects, we see topics aligned with 'social sustainability' as the most apt. While this term is notoriously under-defined,[16] one recent report by the European Parliament synthesizes social sustainability concepts under themes of physical well-being, quality of life, and equity and governance.[17] These values and goals comport well with the WBFGA, and we argue that they are useful norms to include when evaluating the ethical dimensions of Welsh civic technology projects. In the next section we highlight relevant language from the UN SDGs that support the core principles of the WBFGA and their application to public technology.

## *The Well-being for Future Generations Act: the backbone of Digital Well-being for Wales*

The WBFGA is built on seven principles. We believe these four are the most relevant to ethical public sector technology for Wales:

- A More Equal Wales
- A Healthier Wales
- A Wales of Cohesive Communities
- A Globally Responsible Wales

Below, we consider these four principles, supporting discourse from the UN SDGs, and both extrapolate and build principles that apply to ethics and wellbeing matters regarding public sector technologies:

### *A More Equal Wales*

The goal for this WBFGA principle is *"A society that enables people to fulfil their potential no matter what their background or circumstances (including their socio-economic background and circumstances)."*[18] With regard to the UN SDGs, these WBFGA norms are supported by:

> *"We resolve, between now and 2030… to combat inequalities within and among countries; to build peaceful, just and inclusive societies; to protect human rights and promote gender equality and the empowerment of women and girls."*[19]

[16] See European Parliament. (2020). Social Sustainability – Concepts and Benchmarks, Sec. 2, Available at https://www.europarl.europa.eu/RegData/etudes/STUD/2020/648782/IPOL_STU(2020)648782_EN.pdf
[17] Ibid.
[18] Well-being of Future Generations (Wales) Act 2015, Part 2: 4
[19] United Nations. (2015). Transforming our world: the 2030 Agenda for Sustainable Development. A/RES/70/1, Declaration: 3, p. 3

*"We envisage a world of universal respect for human rights and human dignity, the rule of law, justice, equality and non-discrimination; of respect for race, ethnicity and cultural diversity; and of equal opportunity permitting the full realization of human potential and contributing to shared prosperity."*[20]

When applied to public sector technologies, we argue this to imply the following technology governance imperatives:

- Inclusion – Developing technology with all people in mind: minorities, varying ethnicities, people of different abilities, people of different ages, people without the latest devices, people who don't wish to participate online. Inclusion will manifest in
    - *Using* technology – e.g., ensuring the blind can interact with it
    - *Creation* of technology – e.g., making sure that training data for machine learning is broad and diverse
    - *Deployment* of technology – e.g., making certain that poor areas have as much access as wealthier ones

- Preventing harm – Technology harms often fall more strongly upon historically disadvantaged groups and communities.[21] 'Equality' means ensuring that existing and new public sector uses of technology
    - *Probe* their development and use for disproportionate impact, specifically focusing on understanding whether the project contributes to or sustains historical disadvantages
    - *Design* safeguards and strong data protection principles to ward off future misuse or mission creep
    - *Engage* experts in misuse of technology with minority and disadvantaged groups to review system designs and deployments

### *A Healthier Wales*

The goal for this WBFGA principle is: *"A society in which people's physical and mental well-being is maximised and in which choices and behaviours that benefit future health are understood."*[22] In relation, the UN SDG 2030 Agenda states:

[20] Ibid., Our Vision: 8, p. 4

[21] Gangadharan, S. and Niklas, J. (2019). Decentering technology in discourse on discrimination, *Information, Communication & Society, 22*(7): 882-899

[22] Well-being of Future Generations (Wales) Act 2015, Part 2: 4

*"We envisage a world… with equitable and universal access… to health care and social protection, where physical, mental and social well-being are assured."*[23]

*"[A world] in which democracy, good governance and the rule of law, as well as an enabling environment at the national and international levels, are essential for sustainable development, including sustained and inclusive economic growth, social development, environmental protection and the eradication of poverty and hunger."*[24]

Flowing from these WBFGA and UN SDGs principles, we suggest the following technology governance imperatives for public sector technology projects:

- Safeguarding personal mental and emotional health – At the level of the individual, WBFGA and UN SDG inspired digital wellbeing ethics policy would factor for negative nudging, cyber bullying, and whether devices and content are playing a positive role on citizens' lives. A healthier digital ecology (involving design of content, data processing, privacy, and security) is one that encourages positive and potentially more intimate relations with technology and pr-social content providers (e.g., in relation to self-tracking of mental and physical health).

- Safeguarding social health – The concept of health should clearly encompass the broader health of a society, as well as the individual. Social values like the right to dissent, freedom of expression, reduced hostility and, perhaps foremost in relation to public services, the preservation of dignity and privacy must be translated into technical system designs, constraints, and goals.

- Safeguarding democratic health – Similar to the above, the idea of health should also encompass the health of democracy in Wales. The last decade has illustrated how technology can harm democracy: lack of trust in voting, manipulation of public sentiment, opaque interests involved in the democratic functions of the state. Welsh public technology projects must ensure they do not harm democratic institutions or the ability for people to participate in political processes.

[23] United Nations. (2015). Transforming our world: the 2030 Agenda for Sustainable Development. A/RES/70/1, Our Vision: 7, p. 3

[24] Ibid., Our Vision: 9, p. 4

*A Wales of Cohesive Communities*

The goal for this WBFGA principle is: *"Attractive, viable, safe and well-connected communities."*[25] In the language of the UN SDGs, the 2030 Agenda states:

> *"We are determined to ensure that all human beings can enjoy prosperous and fulfilling lives and that economic, social and technological progress occurs in harmony with nature."*[26]
>
> *"We will strive to provide children and youth with a nurturing environment for the full realization of their rights and capabilities, helping our countries to reap the demographic dividend, including through safe schools and cohesive communities and families."*[27]
>
> *"We recognize that sustainable urban development and management are crucial to the quality of life of our people. We will work with local authorities and communities to renew and plan our cities and human settlements so as to foster community cohesion and personal security and to stimulate innovation and employment."*[28]

These suggest the following technology governance imperatives:

- Safe digital environments and experiences for children – Digital experiences and being online are now inseparable from childhood. Children use technology in the home, in school and in their social lives. However, digital platforms are not always good at separating adult content from children's content, and the degree of technical protections for children's use of devices and platforms is variable at best. When deploying public sector technology projects that collect children's data – intentionally or otherwise – Wales must pay special attention to building in safeguards by involving specialists at the earliest stages of development. Efforts to improve safety online for children align with the Future Generations Commissioner's and broader Welsh government focus on preventing 'Adverse childhood experiences.'[29]

- Supporting digital inclusion regarding access – Access to technology is often a socioeconomic issue: the so-called 'digital divide.' Ergo, public sector

[25] Well-being of Future Generations (Wales) Act 2015, Part 2: 4

[26] United Nations. (2015). Transforming our world: the 2030 Agenda for Sustainable Development. A/RES/70/1, Preamble: Prosperity, p. 3

[27] Ibid., The new Agenda: 25, p. 7

[28] Ibid., The new Agenda: 34, p. 9

[29] See https://www.futuregenerations.wales/priority_areas/adverse-childhood-experiences/ ; and https://gov.wales/review-adverse-childhood-experiences-ace-policy-report-html

technology must be built in ways that include older devices and means of access. This is not easy – modern operating systems and platforms are often limited in how far back in time they can be configured. Still, there is an imperative to ensure that, for example, mobile apps are not reliant on operating systems only introduced in the prior twelve months, or that school technology requires powerful computers. Also, the 'shelf-life' and long-term costs of technology must be considered at the outset. That is, how long will a website, an app, a fleet of devices, or a public deployment last? Is there budget for patching, updates and upkeep? These questions relate to, among other things, the overall degree that technology is accessible to various socioeconomic groups.

- Supporting digital inclusion regarding ability – While digital technology permeates modern life, the skill to use it is highly variable. As access to technology is often based on socioeconomic factors, lack of exposure will lead to a lack of facility with using technology. Complicating this is the fact that device interfaces evolve quickly – even those with access to the latest and greatest technology may find themselves confounded by upgrades and changes to screen interactions. These issues imply *design considerations* – the need to ensure that user interactions and experiences are understandable to the greatest number of people, ages and skill levels. This includes everything from language comprehensibility, to ergonomics, to design colours.

- Support for digital literacy and critical thinking – The well-being of future generations will be influenced by their abilities to work with and, importantly, *critically consider* digital technologies. Recent years have brought issues of veracity, misinformation, and disinformation to the fore. Future generations will not only have to contend with basic questions of information source and quality, but also active campaigns to alter opinions and discredit trustworthy sources. 'Digital literacy' takes on a new urgent form considering this, and Welsh public sector technology efforts must both consider this in design stages[30] and actively promote enhanced digital critical thinking skills within education contexts. Such skills will be crucial for social and democratic participation and are essential to ensure an informed citizenry. Efforts to enhance digital literacy and critical thinking are in harmony with the Future

[30] For example, when soliciting public comments on potential changes to the way that broadband companies were regulated by the US Federal Communications Commission, the government website for receiving those comments were overwhelmed by fake submissions – and the regulatory changes proceeded based upon them. See https://ag.ny.gov/press-release/2021/attorney-general-james-issues-report-detailing-millions-fake-comments-revealing

Generations Commissioner's 2017-2023 Strategic Plan, which seeks to equip people with 'Skills for the future.'[31]

### *A Globally Responsible Wales*

The goal for this WBFGA principle is: *"A nation which, when doing anything to improve the economic, social, environmental and cultural well-being of Wales, takes account of whether doing such a thing may make a positive contribution to global well-being."*[32] The UN SDG 2030 Agenda similarly states: *"We are setting out together on the path towards sustainable development, devoting ourselves collectively to the pursuit of global development and of 'win-win' cooperation which can bring huge gains to all countries and all parts of the world."*[33] And: *"We pledge to foster inter-cultural understanding, tolerance, mutual respect and an ethic of global citizenship and shared responsibility."*[34]

For Welsh public sector technology, these goals and language directly align with the ethical principles of beneficence and flourishing. The key technology governance imperatives would be:

- Do good – Projects should be assessed not only for their potential to harm or exploit, but also for their capacity to do good and advance the well-being goals. Data Protection Impact Assessments, Ethical Impact Assessments, and Human Rights Impact Assessments are all examples of tools that can be used with technology projects to ensure that the impacts on the populations being served are not harmful. Projects should also consider the potential for negative effects outside of Wales as well opportunities to have positive impact on the world.

- Alignment with global efforts – If there are ways to align projects with existing global efforts, or to configure them to have positive effects on projects outside of Wales, then they should be so configured. When Welsh public technology projects or methods are ethically innovative, the learnings from those projects should be promoted to the broader global community.

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[31] Purpose 1, p. 6; see https://www.futuregenerations.wales/wp-content/uploads/2018/11/2018-01-03-Strategic-Plan-FINAL.pdf

[32] Well-being of Future Generations (Wales) Act 2015, Part 2: 4

[33] United Nations. (2015). Transforming our world: the 2030 Agenda for Sustainable Development. A/RES/70/1, The new Agenda: 18, p. 6

[34] Ibid., The new Agenda: 36, p. 10

## PRACTICAL ACTIVITIES TO MAXIMISE DIGITAL WELL-BEING

Under the WBFGA, Welsh public agencies have a duty to set and publish objectives designed to maximise their contributions to achieving each of the well-being goals. **the Chief Digital Officer is in an excellent position to help individual agencies and public service boards define, set and publish 'digital well-being objectives.'**

Public agencies must explain *"why the public body considers it has set well-being objectives in accordance with the sustainable development principle, including how the body proposes to involve other persons with an interest in achieving the well-being goals and ensure that those persons reflect the diversity of the population of [Wales]."*[35] This is an ideal place to socialize digital well-being, exploring how the use of public sector technology intersects with the well-being objectives and social sustainability. Furthermore, with appropriate support, the Chief Digital Officer can provide thought leadership about digital inclusion strategies for technology project development. The WBFGA also states, *"A public body may at any other time review and revise its well-being objectives."*[36] Ergo, the Chief Digital Officer can help agencies continually iterate these ideas for technology and data.

Agencies must also set out *"the steps the public body proposes to take to meet those objectives in accordance with the [sustainable development] principle (including how it proposes to govern itself, how it will keep the steps under review and how it proposes to ensure that resources are allocated annually for the purpose of taking such steps)."*[37] For this requirement, with appropriate support, the Chief Digital Officer can promote ethical analyses of digital public services and agency uses of technology, linking such analyses back to digital well-being concepts.

Given that public agencies are obligated to determine *"how deploying resources to prevent problems occurring or getting worse may contribute to meeting the body's well-being objectives, or another body's objectives*,"[38] with appropriate support, the Chief Digital Officer can help agencies link precautionary approaches to technology projects, illustrating how they align with digital well-being and *Prevention* of the Five Ways of Working.

The WBFGA requires Welsh Ministers to *"publish indicators… measuring progress towards the achievement of the well-being goals, and … must be expressed as a value or characteristic that can be measured quantitatively or qualitatively against a*

[35] Well-being of Future Generations (Wales) Act 2015, Part 2: 7(1)(b)

[36] Ibid., Part 2: 9(5)

[37] Ibid., Part 2: 7(1)(c)

[38] Ibid., Part 2: 5(2)(e)

*particular outcome."*[39] The Chief Digital Officer, with appropriate support, can supply thought leadership on digital well-being and ethical technology approaches to gradually allow Ministers to craft relevant indicators. These can be aligned with and feed back into international thought, instruments and policy, such as UN activities and the proposed UK Wellbeing of Future Generations Bill.[40] And, both Welsh Ministers and the Future Generations Commissioner are required to publish reports on the implementation and success of the WBFGA. The Chief Digital Officer could be key experts in the digital well-being dimensions of these reports.

We suggest The Future Generations Commissioner convene an Advisory Panel as it currently has no digital technology experts.[41] Mindful of resources and support, and that composition of the WBFGA's current Advisory Panel would require Ministerial approval and legislative change, there is value in a representative for the Chief Digital Officer and/or an external digital ethics expert joining on the Panel. The Chief Digital Officer could become experts to help local public service boards ensure that digital well-being is included when cities or counties are procuring and launching technology – e.g., asking questions like, "Does this website exclude the blind, the colourblind, or older people? What is the impact of a proposed technology project on children, such as cameras on public buses? Does this project give too much power to the vendors? Is cybersecurity sufficiently accounted for?"

Further, the Auditor General is required to assess public agencies on their implementation of well-being goals and report back to the National Assembly.[42] In his May 2020 report, the Auditor General notes that "Digital" is one of the themes his office examined across 44 public bodies.[43] However, the only mention of anything digital in the entire report is: "We found a few examples of public bodies seeking and responding to views on a routine basis. This included creating opportunities for 'real time' feedback, often using digital technology."[44] This indicates an insubstantial amount of consideration of digital issues by the Auditor General. As such, the Chief Digital Officer with appropriate support could provide expert views to the Auditor General office to broaden their understanding of the intersection of digital technology and well-being and improve their assessment methodologies.

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[39] Ibid., Part 10: 1(a) and 2(a)

[40] See https://lordslibrary.parliament.uk/wellbeing-of-future-generations-bill-hl/

[41] Future Generations Commissioner for Wales. (2022). Our Team: Advisory Panel, https://www.futuregenerations.wales/about-us/our-team/

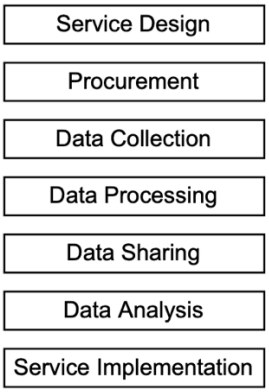
[42] Well-being of Future Generations (Wales) Act 2015, Part 15

[43] Auditor General for Wales. (2020). So, what's different? Findings from the Auditor General's Sustainable Development Principle Examinations, p. 11, https://www.audit.wales/sites/default/files/Well-being-of-Future-Generations-report-eng_11.pdf

[44] Ibid., p. 44

## PUTTING THE HOT-BUTTON ISSUES IN CONTEXT

The Chief Digital Officer is fielding many questions from agencies about developing or deploying technology that may have ethical dimensions worth considering. Issues arising include use of AI to identify litterers, reuse of satellite imagery for purposes different than from initial collection, use of drones, sensors used in public spaces to detect vandalism, and use of AI to identify areas for upkeep on public roadways. In addition to ethics methods and WBFGA/UN SDG alignment suggested above, we also we recommend the idea of a Welsh Public Sector Technology & Data Lifecycle framework to develop a more general set of resources and responses. This aligns with the 'artifact' and 'application' technology levels approach discussed in the How to Do Digital Ethics section above and is a 'policy ready' practical approach for addressing the questions already arriving. Initially, this framework can be comprised of the following seven headings:




Questions received by the office can be placed into one of the seven categories, each of which is addressed with different resources. E.g.:

- *Service Design* considers the type of technologies, how invasive they are, whether planned data collection follows the principle of Minimization, whether the architecture is fit for purpose.
- *Procurement* ensures that contracting terms do not give too much data to third parties, and that vendors' cybersecurity requirements are strong.
- *Data Collection* ensures that the principle of Minimization is employed, that the data is accurate, and that the principle of Storage Limitation is used. Issues of bias and representativeness within data would be considered at both this stage and the service design stage.
- *Data Processing* raises questions of sufficient expertise within a public agency, further considerations of bias, and reviews of internal data access controls within public bodies.
- *Data Sharing* invokes an analysis of whether data is sufficiently protected for it to be shared. Issues include de-identification, data use agreements with

partners, and consideration of downstream use. Questions of adequate consent arise both here and in the Service Design stage, as well as considering whether members of the public would expect their personal data to be shared for a given context.[45]

- *Data Analysis* would take into consideration data quality and whether any prior steps of the project should be reiterated.
- *Service Implementation* examines the practical dimensions of deploying and running a project – sufficiency of resources, operational planning, project longevity, avoidance of 'mission creep' (unplanned repurposing of data), appropriate relationships with vendors, and further considerations of equity.

These headings and their focuses are indicative, but they illustrate a framework by which incoming questions can be categorized and 'triaged.' By approaching questions in this manner, the Chief Digital Officer will develop expertise in applying ethics and data protection views and tools to an ever-widening range of technology projects. This will enable generalized and standardized approaches to digital well-being guidance for public agencies. Regarding the WBFGA, these efforts support the Future Generations Commissioner's goal of "Changing our Public Sector Culture."[46]

[45] The concept of 'Contextual Integrity' is useful here. See Shaffer, G. (2021). Applying a Contextual Integrity Framework to Privacy Policies for Smart Technologies. *Journal of Information Policy, 11*(1): 222–265

[46] Future Generations Commissioner for Wales. (2022). Leadership and implementation of the Act: Changing our public sector culture, https://futuregenerations2020.wales/english?category=public-sector

## *"WHILE IT MAY BE LEGAL, SHOULD WE DO IT?":* CONSENT, DATA SHARING, AND THE DIGITAL ECONOMY ACT

A key discussion that arose in formative conversation with the Chief Digital Officer and Welsh Government is the relationship between law and ethics. This applies well to data sharing among public services, especially where consent is not seen as the best route to justify processing of citizen personal data. Part V of the UK Digital Economy (DE) Act grants broad powers to public agencies to share data amongst themselves without first obtaining consent from data subjects, though there are important limitations to these powers:

- Only limited public authorities can access the powers for specific purposes, and any changes to that list require legislative change (triggering public consultation and impact assessments).
- Any new objectives for the powers to share for public service delivery require approval by a Review Board as well as legislative action.
- Using the powers to identify and tackle public sector fraud and debt must be established as pilots so they can be monitored properly.
- All data sharing using any of the powers must comply with the relevant Code of Practice – these require public authorities to take a number of steps before any data is shared, including impact assessments, consideration of the existing UK Government Data Ethics frameworks, and ensuring the data shared is only what is required and proportionate to aims.

These limitations are welcome, useful, and apply meaningful regulatory controls to government use of personal data. Still, the ability to use data without consent should not be automatically used: we argue that this part of the law risks straining the social contract and harming public trust. Although we do not have space for fuller philosophical analysis, we note that Qu.5 of the survey (discussed in the next section) shows little appetite for assumed consent.

Regarding sharing data amongst the large group of agencies covered by the Act[47] for public service delivery, ensuring the well-being of individuals and households, and preventing a range of 'anti-social behaviours,'[48] data ethics implies very high bar for sharing. More generally, cross-agency data sharing by government should be thoroughly considered via the question: "While it may be legal, should we do it?" Some initial frameworks to answer this question are:

- The informational separation of powers. Personal data makes people legible and transparent to government; it gives agencies power over people. Whilst personal data enables agencies to perform their public service mandates, too

[47] See Schedule 4 of the Act

[48] See Part V, Ch. 1 of the Act

much data or inappropriately obtained data can lead to government overreach and an informationally intrusive state. In classical political theory there exists the 'separation of powers' doctrine, where the political authority of a state is divided into different branches of government, often Legislative, Executive and Judicial.[49] The purpose is to prevent too much concentration of power and allow for checks and balances between the branches. In a pivotal case in the early 1980s, the German Constitutional Court ruled that the German state could not be considered a single data processor. Rather, individual agencies should be considered separate processors, and that therefore there must be an '*informational* separation of powers.'[50] This concept serves multiple goals: it gives voice to the data protection principle of Proportionality (do not collect more data than is needed for a given service) and Purpose Specification (specify the purpose for which you are collecting data, and do not use it for other purposes, and it enhances efforts to prevent a state from having too much information. While the DE Act flies directly in the face of the informational separation of powers, it nonetheless serves as an important concept to highlight the dangers of weakly governed internal data sharing by government.

- The Precautionary Principle. As discussed in previous sections, the Precautionary Principle is a family of ideas that urge deliberation and precaution in the development and use of technology. It argues that harms should be prevented rather than remediated, even when concrete proof of that harm is elusive. Ergo, when citizens' data is to be used in ways that do not match the purpose for which they were collected with promises of enhanced efficiency and benefit, a precautionary approach would push back on such uses, requiring greater proof that they will both bring benefit and not create harms or unintended consequences. Methods to do this include engaging experts, public deliberation, and higher burdens of proof upon those who wish to use the data. In line with data minimization and proportionality principles, agencies should minimize the number of other entities with whom it shares data to the least number needed, and create strong, auditable access controls in service of accountability and transparency.

- Ethical impact assessment. A more recent tool for evaluating technology projects is the ethical impact assessment (EIAs). Where DPIAs are focused specifically on data protection principles, and, arguably, on achieving *legal*

[49] Benwell, R. and Gay, O. (2021). The Separation of Powers. UK Parliament Standard Note SN/PC/06053, available at https://researchbriefings.files.parliament.uk/documents/SN06053/SN06053.pdf
[50] Hornung, G. and Schnabel, C. (2009). Data protection in Germany I: The population census decision and the right to informational self-determination. *Computer Law & Security Report 25*(1): 84-88.

compliance, EIAs take much broader ethical ideas into consideration. And, while DPIA's are legally required, Wales would be benefit from using EIAs. Many EIAs and related tools formulated for technology projects have been published in the last two decades, and they afford multiple ways to consider if sharing personal data under the auspices of the DE Act is ethical. More broadly, EIAs can help engage with project stakeholders to surface potential future harms and alternative ways of collecting and using data.[51]

[51] Wright, D. (2011). A framework for the ethical impact assessment of information technology. *Ethics of Information Technology 13*(3): 199–226; Søraker, J. and Brey, P. (2015). Ethics Assessment in Different Fields: Information Technologies. SATORI Project, Deliverable 1.1, https://satoriproject.eu/media/2.b.1-Information-technology.pdf; See Marx's 29 Questions to Help Determine the Ethics of Surveillance in Table 1 of Marx, G. (1998). Ethics for the New Surveillance. *The Information Society, 14*(3): 171-185.

## UK/WALES DIGITAL ETHICS SURVEY

Between March 25-28th 2021 we carried out a survey to understand public feeling about Government and public sector use of technologies.[52] This was an online omnibus survey, implemented by survey company ICM Unlimited. Due to issues of project time length and cost, counter-intuitively, it was only possible to sample the whole of the UK (n=2073) rather than Wales only (giving n=109). Although the Welsh sample size was much reduced and, critically, the survey could only be disseminated in English, the Welsh responses align closely with all-UK responses, lending confidence to the results. Absence of aberrant and unexpected results also provides confidence.

The survey was conducted online, interviewing a nationally representative sample of c.2,000 British adults (aged 18+). The nationally representative profile was based on census data collected by Office for National Statistics. The survey groups were segmented by gender, age, government office regions, social class, number of cars in household, highest educational level, ethnicity, household income, age of children, marital status, household tenure, ITV region, and working status

Online delivery of the survey meant that the respondents had a minimum baseline of online literacy, and hence would be arguably more digitally literate than the average UK population. While this excludes some people, digital literacy in the UK is very high. The number of adults who have either never used the internet or have not used it in the last three months, has been steadily declining over the past decade: Office for National Statistics survey data from 2020 found that 95% of UK adults had used the internet in the past 3 months.[53]

Our 10 closed-ended survey questions were designed to probe a range of issues, including: overall feelings about digital technologies and government protections of personal data; potential sharing of data among public services, to probe Digital Economy Act 2017 concerns; use of emergent "smart" sensing and actuation technologies (a 'hot button' issue); attitudes to innovation, precaution, and Government use of technology; data sharing among public sector agencies and issues of consent (a 'hot button' issue); use of technology in policing; use of autonomous decision-making systems in the public sector (a 'hot button' issue,

[52] See Appendix for questions and percentages. Full survey responses segmented by gender, age, government office regions, social class, number of cars in household, highest educational level, ethnicity, household income, age of children, marital status, household tenure, ITV region, and working status: https://docs.google.com/spreadsheets/d/1kMd-6UKyPLb-qLng6eqRfELC0AJOlOwD/edit?usp=sharing&ouid=101414047201492430775&rtpof=true&sd=true

[53] Office for National Statistics. (2020). *Internet access – households and individuals, Great Britain: 2020.* https://www.ons.gov.uk/peoplepopulationandcommunity/householdcharacteristics/homeinternetandsocialmediausage/bulletins/internetaccesshouseholdsandindividuals/2020

overlapping with interest in application of the Digital Economy Act 2017); child-specific issues; perceptions of future-generations and new technologies; and attitudes to use of health data (a 'hot button' issue).

*Findings and insights*

Due to inherent methodological problems with polling, we strongly suggesting treating the results with care, and recommend seeing them as "interesting" and, where relevant, as a prompt for further study. Critically too, while public opinion is important, surveys on attitudes to technologies and implications the public are unfamiliar with is problematic.

Caveats aside, there are interesting signals from the data. Due to the nature of this "Sprint" project for the Welsh Data Nation Accelerator (WDNA), we have not had time to drill into implications for each of the demographic subcategories, but please get in touch with Prof. Andrew McStay if you require further clarification on the significance of findings or analysis of demographic subcategories.

On signals and insights, first is that *Wales and the wider UK are for the most part aligned in their attitudes to questions of technology, well-being, hopes, fears, and the role of emerging technologies in public service*. Throughout the tables presented in Appendix 1 we see no significant deviation of Wales from the UK in terms of attitudes to the issues we tested for.

With the Q1 being about Government role in overall protection of personal data, we note that *UK and Wales citizens do not trust that the government does a good job in keeping companies and other organisations that use their personal data in check*, perhaps encouraging greater visibility of both UK and Wales Information Commissioner's Offices (see Q1.2). This is amplified by Q1.3 that indicates ambiguity regarding awareness of who citizens should complain to if they had concerns about how their online personal data is used or derived from them.

With formative conversation between the researchers and the Chief Digital Officer being interested in the implications of the Digital Economy Act 2017 (and its focus on sharing data between public services) and ethical debate caused when an act may be legal but morally questionable, Q2 probed data sharing among Government services. For the most part, *citizens appear to be trusting in Government and sharing between public services* (see Q2.1). With this being a technical matter (requiring consideration of what data, with whom, and with what security guarantees) we suggestion caution, but openness to the sharing is notable. While there is openness to sharing, it is also evident that *when presented with potential harm in the form of data being used in unexpected ways, citizens express*

*concern* (see Q2.3). This suggests a need for sincere and meaningful transparency, and internal policy conversations about what citizens' reasonable expectations might mean.

Taken overall, Qu 3. indicates that *UK and Wales citizens are well-disposed to add more monitoring technologies*. We were surprised to see little distinguishing between monitoring of cars (involving ANPR and personal data) and people (potential vandals) and use of sensors to monitor air quality. Further assessment of the raw findings may be required to drill down to marginalised social groups. We note for example a slightly higher response for 'strongly agree' but a significantly lower response in the 'tend to agree' category for those who identify as Black or Black British.

Qu 4. indicates that, overall, UK and Wales citizens see technology innovation as beneficial and that it is of clear benefit to society. Interestingly, they are also very supportive of the premise that that governments should innovate with technology at the same speed as the private sector. However, there is a clear signal that the 'Move fast and break things' approach to innovation is rejected (see Qu 4.4). Rather, *respondents were quite clear that they wish to see social values like privacy, wellbeing, fairness, human rights, and social equality championed within government use of new technology*. Evidence of a support for a precautionary approach to technology governance is evident in overall UK and Welsh citizen concerns about the level of power technology companies have.

Q5. probed issues of consent in relation to sensitive uses of data sharing among public services. One third of respondents were comfortable with government using personal data without consent or notification, and one third were not, except where children were at risk (Qu 5.1), for which half were comfortable. We are mindful that these are deeply complex questions that are better suited for qualitative research. Consequently, we see the findings as signalling need for closer research.

Q6. UK and Welsh citizens also appear to be mostly supportive of a wide range of surveillance technologies, including live and retrospective facial recognition (Q6.1 and Q6.2). This warrants further follow-up work given that surveys are problematic for assessing how citizen think about technologies they are unfamiliar with. We were also surprised to see signals of support from Asian and Black communities, given stated risks of potential misrecognition for these groups. However, attention should be drawn to the sample size (i.e., 1873 for White respondents, 42 for Black/Black British, and 87 Asian). We suggest follow-up work, focusing on groups at greater risk from surveillance either for economic or ethnicity reasons.

Qu 7. probed autonomous decision-making in public services. This again involved researcher effort to simplify complex processes into straightforward propositions. Notwithstanding weaknesses in the online survey method, broadly *UK and Welsh citizens are accepting of autonomous decision-making*, for the most part stating that they trust it to predict likelihood to re-offend (Qu 7.1). A stronger signal however is that UK and Welsh citizens *see need for full and satisfactory public sector explanation for their decisions* (Qu 7.3), along with *clear need for independent testing* autonomous decision-making for social discrimination (Qu 7.4).

As there are low amounts of research on children and technology, and that until recently child rights have not been adequately represented in data protection rights and law, Qu 8. focused on children. Qu 8.1 clearly shows that UK and Wales citizens believe the Internet to be a risky place for children (with only 5% disagreeing). Attitudes to facial recognition (Qu 8.2) and emotion recognition (Qu 8.3) in schools were more mixed, although citizens erred towards discomfort with both these technologies in schools.

Citizens appear to be positive on attitudes to the role of technology in society and future generations (Qu 9.), believing that future generations will be better off than the current one in this regard. Qu 9.4 received an especially strong response, indicating that UK and Wales citizens both believe that government has a strong role to play in protecting future generations regarding the development of technology and technology markets.

The final question (10) probed attitudes to collection and use of health data. Citizens appear to be trusting of Government with health data (Qu 10.1) and are also interested in ways in which they might provide more health data (Qu 10.2) in service of the public good. Qu 10.4 however indicates a desire for this data to only be used for the public good, with citizens mostly indicating a worry that that health data could be used against then, such as with applying for private insurance, or that their employers could find out.

## DIGITAL ETHICS RESOURCES

### People and institutions

Ada Lovelace Institute
AI Now Institute
Algorithmic Fairness and Opacity Group, UC Berkeley
BABL AI
Center for AI and Digital Policy
Centre for AI and Digital Ethics, University of Melbourne
Centre for Data Ethics & Innovation
Dataethics.eu
Data Justice Lab, Cardiff University
Data & Society Research Institute
David Wright, Trilateral Research
Emotional AI Lab, Bangor University
Evan Selinger, Rochester Institute of Technology
Foundation for Responsible Robotics
Indigenous Protocol and Artificial Intelligence Working Group
Mark Latonero, NIST
Michael Zimmer, Marquette Center for Data, Ethics, and Society
Minderoo Centre for Technology and Democracy
Nathalie Smuha, KU Leuven
Oxford Internet Institute
Oxford Institute for Ethics in AI
Partnership on AI
Roger Clarke, Xamax Consultancy
Shannon Vallor, Edinburgh Futures Institute

### Public agencies

CNIL – Report: How Can Humans Keep the Upper Hand?
European Data Protection Supervisor – Ethics work
European Commission High-level expert group on artificial intelligence
European Commission – Ethics and Data Protection
German Data Ethics Commission
Nesta - 10 principles for public sector use of algorithmic decision making

### Conferences

Digital Ethics Summit, techUK
RightsCon
Summer School on the Law, Ethics and Policy of Artificial Intelligence, KU Leuven
Symposium on Intercultural Digital Ethics, Harvard Kennedy School

Ethics guidance and checklists

AI Now – Algorithmic Impact Assessments: A Practical Framework for Public Agency Accountability
Future of Life Institute – Asilomar AI Principles
Emotional AI Lab – Emotional Artificial Intelligence: Guidelines for Ethical Use.
IEEE initiative on Ethics of Autonomous Systems and Ethically Aligned Design.
The Montreal Declaration for Responsible AI
European Commission: Statement on Artificial Intelligence, Robotics and 'Autonomous' Systems
The "five overarching principles for an AI code" in the UK House of Lords Artificial Intelligence Committee's report, AI in the UK: ready, willing and able?

## CONCLUSION AND WHAT NEXT?

Funded as a "Sprint" project for the Welsh Data National Accelerator (WDNA), this report has certainly been researched and assembled at speed. However, it builds on established expertise of the authors and provides the reader a useful primer on ethics, how to do ethics work in a digital context, and what digital ethics might mean in Wales. Although there is a degree of policy expedience in aligning with the Well-being of Future Generations (Wales) Act 2015, this is allayed by it being an excellent moral piece of law. With technology missing from the Act, the need and goal were clear: to go back up a step to the United Nations' Sustainability Development Goals that do address technology, and then unpack and add extra detail on what the Goals signify. Both UK and Welsh citizens seem to align well with this worldview, signalling interest in new technologies but also strong desire for protections. The survey provided a starting point for engaging citizen perspectives, but as noted below we recommend deeper quantitative and qualitative work. We strongly suggest too that survey findings are treated as interesting and worthy of follow-up, rather than that which might steer policy.

On what next, we suggest:

1. Continue work on aligning technology ethics and public service usage, with the Well-being of Future Generations (Wales) Act 2015. This report identifies the opportunity and begins the work, but it is not the last word.
2. Engage Welsh and other experts: Welsh universities and other thought-leaders can help staff advisory groups.
3. Circulate this report and use it as a means of investing in ethics as it will pay international reputational dividends.

## APPENDIX: DIGITAL ETHICS SURVEY QUESTIONS AND RESPONSES

The public sector provides all Government-funded public services in the UK. They are responsible for services such as firefighting, policing, healthcare, education, housing, refuse collection, and social care. We would now like to ask your opinion on use of digital technologies and personal data by government and public sector services.

| Qu.1 This question is about personal data, which is information that relates to you in some way and can be connected back to your identity. Do you feel that the government sufficiently protects your online personal data from being misused by companies and other organisations? | | | |
|---|---|---|---|
| **Statement** | **Agreement type** | **Overall UK (%)** | **Wales (%)** |
| 1. I feel entirely safe online, I have no concerns about my personal data, and trust that the government and its agencies do a good job in keeping companies and other organisations that use personal data in check | Strongly agree | 8 | 4 |
| | Tend to agree | 26 | 22 |
| | Neither agree or disagree | 30 | 24 |
| | Tend to disagree | 28 | 37 |
| | Strongly disagree | 9 | 13 |
| 2. I am very concerned about what happens to my personal data online. I do not trust that the government does a good job in keeping companies and other organisations that use my personal data in check | Strongly agree | 18 | 24 |
| | Tend to agree | 37 | 36 |
| | Neither agree or disagree | 29 | 25 |
| | Tend to disagree | 14 | 15 |
| | Strongly disagree | 2 | 0 |
| 3. I know who I would complain to if I had concerns about how my online personal data is used or derived from me | Strongly agree | 9 | 7 |
| | Tend to agree | 24 | 22 |
| | Neither agree or disagree | 25 | 20 |
| | Tend to disagree | 31 | 37 |
| | Strongly disagree | 11 | 13 |

| Qu 2. The government would like to make it easier for public sector bodies to re-use, share and access data across different departments (such as healthcare, social care, and benefits). However, the sharing of personal data increases the risk of a data breach, lack of control over what data is being shared, breaking of confidentiality, and data being used in ways a citizen is unhappy with. Do you trust the government with sharing your personal data across departments? | | | |
|---|---|---|---|
| **Statement** | **Agreement type** | **Overall UK (%)** | **Wales (%)** |
| 1. In general, I trust the government organisations with my personal data and that the government will make sure my data is safe if shared between and used by more than one public service. | Strongly agree | 8 | 6 |
| | Tend to agree | 30 | 34 |
| | Neither agree or disagree | 31 | 25 |
| | Tend to disagree | 21 | 24 |
| | Strongly disagree | 10 | 12 |
| 2. I have no concerns about public agencies sharing my data between themselves | Strongly agree | 7 | 4 |
| | Tend to agree | 22 | 19 |
| | Neither agree or disagree | 28 | 30 |

| | | | |
|---|---|---|---|
| because it would make the public sector more efficient. | Tend to disagree | 30 | 30 |
| | Strongly disagree | 13 | 17 |
| 3. I would be concerned that increased sharing of data among public sector bodies would lead my data to be used in ways I would not expect or approve of. | Strongly agree | 24 | 25 |
| | Tend to agree | 40 | 41 |
| | Neither agree or disagree | 26 | 22 |
| | Tend to disagree | 8 | 8 |
| | Strongly disagree | 2 | 4 |

**Qu 3. I feel that the government and public authorities can be trusted not to abuse their power if allowed to add more monitoring technologies to public places, such as:**

| Statement | Agreement type | Overall UK (%) | Wales (%) |
|---|---|---|---|
| 1. Automatic number plate recognition and detection of vehicles parked in unauthorized spaces. | Strongly agree | 23 | 17 |
| | Tend to agree | 39 | 35 |
| | Neither agree or disagree | 26 | 26 |
| | Tend to disagree | 11 | 14 |
| | Strongly disagree | 4 | 7 |
| 2. Sensors to monitor urban vandalism (but not the vandal) and report breakages back to authorities) | Strongly agree | 18 | 18 |
| | Tend to agree | 39 | 43 |
| | Neither agree or disagree | 30 | 265 |
| | Tend to disagree | 9 | 9 |
| | Strongly disagree | 3 | 5 |
| 3. Sensors to monitor vandalism and report breakages back to authorities, that would also alert cameras to point at the place where vandalism is taking place | Strongly agree | 22 | 15 |
| | Tend to agree | 42 | 40 |
| | Neither agree or disagree | 26 | 35 |
| | Tend to disagree | 8 | 8 |
| | Strongly disagree | 2 | 2 |
| 4. Sensors to monitor air quality | Strongly agree | 22 | 22 |
| | Tend to agree | 42 | 41 |
| | Neither agree or disagree | 26 | 30 |
| | Tend to disagree | 6 | 5 |
| | Strongly disagree | 3 | 2 |

**Qu 4. This question is about balancing the speed of innovation with precaution in the development and use of new technologies. Do you agree or disagree with the following statements?**

| Statement | Agreement type | Overall UK (%) | Wales (%) |
|---|---|---|---|
| 1. Technology innovation is generally beneficial, and usually improves society. | Strongly agree | 14 | 14 |
| | Tend to agree | 48 | 40 |
| | Neither agree or disagree | 29 | 34 |
| | Tend to disagree | 7 | 9 |
| | Strongly disagree | 1 | 3 |
| | Strongly agree | 17 | 20 |

| | | | |
|---|---|---|---|
| 2. Government should innovate with technology at the same speed as the private sector. | Tend to agree | 44 | 38 |
| | Neither agree or disagree | 32 | 35 |
| | Tend to disagree | 6 | 8 |
| | Strongly disagree | 1 | 0 |
| 3. The government should move more slowly than the commercial sector does in terms of technology innovation because the consequences for society are higher. | Strongly agree | 9 | 9 |
| | Tend to agree | 26 | 19 |
| | Neither agree or disagree | 43 | 52 |
| | Tend to disagree | 19 | 18 |
| | Strongly disagree | 3 | 2 |
| 4. The government should ensure social values - like privacy, fairness, well-being, human rights, and social equality - are championed in its own use of new technology. | Strongly agree | 34 | 44 |
| | Tend to agree | 43 | 38 |
| | Neither agree or disagree | 19 | 17 |
| | Tend to disagree | 3 | 1 |
| | Strongly disagree | 0 | 0 |
| 5. I believe that technology companies have too much power, and that the government should exert its powers over them more. | Strongly agree | 19 | 24 |
| | Tend to agree | 37 | 38 |
| | Neither agree or disagree | 34 | 31 |
| | Tend to disagree | 9 | 7 |
| | Strongly disagree | 1 | 0 |
| 6. Bans and limitations on technology are acceptable methods of protecting society | Strongly agree | 11 | 15 |
| | Tend to agree | 39 | 39 |
| | Neither agree or disagree | 37 | 27 |
| | Tend to disagree | 11 | 17 |
| | Strongly disagree | 3 | 2 |

| Q5. The government has broad powers to share data among public agencies without people's consent. Do you agree or disagree with the use of these powers? | | | |
|---|---|---|---|
| **Statement** | **Agreement type** | **Overall UK (%)** | **Wales (%)** |
| 1. The government should be able to share data among agencies to help children of 'troubled families' without first obtaining consent from family members | Strongly agree | 14 | 16 |
| | Tend to agree | 37 | 31 |
| | Neither agree or disagree | 28 | 34 |
| | Tend to disagree | 14 | 10 |
| | Strongly disagree | 7 | 8 |
| 2. Without first obtaining consent from citizens in question, the government should be able to share personal data among agencies to prevent risk of 'anti-social behaviour' | Strongly agree | 10 | 11 |
| | Tend to agree | 30 | 22 |
| | Neither agree or disagree | 30 | 31 |
| | Tend to disagree | 19 | 27 |
| | Strongly disagree | 11 | 9 |
| 3. Without first obtaining consent from citizens, the government should be able to share data among public agencies *and commercial debt collection companies* to address a debt owed to the public sector | Strongly agree | 9 | 11 |
| | Tend to agree | 21 | 18 |
| | Neither agree or disagree | 28 | 29 |
| | Tend to disagree | 25 | 20 |
| | Strongly disagree | 17 | 22 |
| | Strongly agree | 8 | 14 |

| | | | |
|---|---|---|---|
| 4. Without first obtaining consent from citizens, the government should be able to share identifiable patient health data between the NHS and local councils | Tend to agree | 23 | 15 |
| | Neither agree or disagree | 28 | 25 |
| | Tend to disagree | 23 | 20 |
| | Strongly disagree | 17 | 26 |

**Q6. This question is about use of new technologies in policing and how comfortable you are with new policing practices. Do you agree or disagree with the use of these new technologies?**

| Statement | Agreement type | Overall UK (%) | Wales (%) |
|---|---|---|---|
| 1. I am comfortable with facial recognition that compares a live camera feed of faces against a predetermined watchlist of faces. Despite risks of low accuracy, lack of choice to be screened, and in some cases misrecognition of Asian and Black faces, I think its use in places such as train stations and large sporting events will keep people safe. | Strongly agree | 14 | 12 |
| | Tend to agree | 33 | 22 |
| | Neither agree or disagree | 29 | 39 |
| | Tend to disagree | 15 | 19 |
| | Strongly disagree | 9 | 7 |
| 2. Despite risk that these technologies may be used disproportionately with socially marginalised communities, I am comfortable with use of predictive policing technologies that promise to predict criminality or who may be a victim of a crime. | Strongly agree | 11 | 11 |
| | Tend to agree | 33 | 29 |
| | Neither agree or disagree | 34 | 33 |
| | Tend to disagree | 13 | 15 |
| | Strongly disagree | 8 | 12 |
| 3. I trust the police with extra powers to use retrospective facial recognition technologies (where pictures of faces can be detected in previously collected camera footage from burglaries, assaults, shootings and other crime scenes, or footage submitted by members of the public). | Strongly agree | 15 | 11 |
| | Tend to agree | 36 | 42 |
| | Neither agree or disagree | 26 | 24 |
| | Tend to disagree | 13 | 11 |
| | Strongly disagree | 9 | 12 |
| 4. In general, I think the police can be trusted with using the latest new technologies. | Strongly agree | 12 | 10 |
| | Tend to agree | 39 | 38 |
| | Neither agree or disagree | 29 | 27 |
| | Tend to disagree | 13 | 16 |
| | Strongly disagree | 8 | 9 |

**Qu 7. The public sector increasingly uses autonomous computer-based decisions, such as in policing to predict criminality, to judge authenticity of benefit claims, to gauge who is at risk of child abuse, and to decide who is most eligible to get social housing. Do you agree or disagree with the use of these types of systems?**

| Statement | Agreement type | Overall UK (%) | Wales (%) |
|---|---|---|---|
| 1. If used by the police to judge likelihood of reoffending, I trust that these types of | Strongly agree | 12 | 9 |
| | Tend to agree | 27 | 22 |
| | Neither agree or disagree | 36 | 38 |

| | | | |
|---|---|---|---|
| systems would make fair and unbiased judgements. | Tend to disagree | 15 | 18 |
| | Strongly disagree | 10 | 13 |
| 2. If a public sector organisation made an unusual or surprising decision about me (such as a reduction in benefits or a visit from a social worker to check on a child), and that judgement was made by a computer, I would know how to challenge it. | Strongly agree | 13 | 8 |
| | Tend to agree | 20 | 17 |
| | Neither agree or disagree | 25 | 22 |
| | Tend to disagree | 23 | 29 |
| | Strongly disagree | 18 | 25 |
| 3. I do not think it is acceptable to use these systems to make judgements, decisions and predictions, unless they can generate a full and satisfactory explanation for their decisions. | Strongly agree | 27 | 25 |
| | Tend to agree | 35 | 42 |
| | Neither agree or disagree | 26 | 20 |
| | Tend to disagree | 9 | 12 |
| | Strongly disagree | 2 | 0 |
| 4. If these systems are to be used, I would like to see them independently tested for social discrimination, especially those used by the police and criminal justice system | Strongly agree | 30 | 35 |
| | Tend to agree | 38 | 36 |
| | Neither agree or disagree | 25 | 23 |
| | Tend to disagree | 5 | 4 |
| | Strongly disagree | 2 | 2 |

| Q 8. Children are increasingly immersed in digital and online technologies and services. This brings risk but also opportunities. How do you feel about the following? | | | |
|---|---|---|---|
| **Statement** | **Agreement type** | **Overall UK (%)** | **Wales (%)** |
| 1. I feel that the Internet is a risky place for children. | Strongly agree | 31 | 43 |
| | Tend to agree | 42 | 38 |
| | Neither agree or disagree | 22 | 15 |
| | Tend to disagree | 4 | 1 |
| | Strongly disagree | 2 | 3 |
| 2. I am happy for use of facial recognition in schools to identify who a child is for purpose of serving their school lunch more efficiently | Strongly agree | 11 | 7 |
| | Tend to agree | 24 | 16 |
| | Neither agree or disagree | 26 | 32 |
| | Tend to disagree | 21 | 18 |
| | Strongly disagree | 18 | 28 |
| 3. I am happy for cameras in classrooms and in online learning to judge facial emotion expressions and whether children are paying attention or not | Strongly agree | 11 | 7 |
| | Tend to agree | 23 | 16 |
| | Neither agree or disagree | 21 | 26 |
| | Tend to disagree | 24 | 27 |
| | Strongly disagree | 21 | 24 |
| 4. I think that while social media companies do not behave perfectly, social media is not as risky to children as is sometimes supposed | Strongly agree | 9 | 4 |
| | Tend to agree | 19 | 16 |
| | Neither agree or disagree | 26 | 27 |
| | Tend to disagree | 26 | 29 |
| | Strongly disagree | 20 | 24 |

| Qu 9. This question is about whether future generations will be better or worse off in relation to digital technologies. Do you agree or disagree with the following statements? | | | |
|---|---|---|---|
| **Statement** | **Agreement type** | **Overall UK (%)** | **Wales (%)** |
| 1. I believe that, in terms of digital technologies, future generations will be better off than the current one. | Strongly agree | 16 | 8 |
| | Tend to agree | 36 | 30 |
| | Neither agree or disagree | 35 | 42 |
| | Tend to disagree | 9 | 16 |
| | Strongly disagree | 3 | 3 |
| 2. I think that the direction of digital technology is dangerous or wrong, and that future generations are in trouble. | Strongly agree | 11 | 10 |
| | Tend to agree | 24 | 30 |
| | Neither agree or disagree | 37 | 39 |
| | Tend to disagree | 22 | 15 |
| | Strongly disagree | 5 | 5 |
| 3. I feel like there are some good aspects and some troubling aspects of how technology is developing, and I think that future generations will both experience benefit and some downsides. | Strongly agree | 26 | 25 |
| | Tend to agree | 49 | 51 |
| | Neither agree or disagree | 21 | 19 |
| | Tend to disagree | 3 | 5 |
| | Strongly disagree | 1 | 0 |
| 4. I think that government has a strong role to play in protecting future generations regarding the development of technology and technology markets. | Strongly agree | 29 | 30 |
| | Tend to agree | 45 | 46 |
| | Neither agree or disagree | 22 | 19 |
| | Tend to disagree | 3 | 5 |
| | Strongly disagree | 1 | 0 |

| Q 10. This question is about the collection and protection of health data. Do you agree or disagree with the following statements? | | | |
|---|---|---|---|
| **Statement** | **Agreement type** | **Overall UK (%)** | **Wales (%)** |
| 1. I believe the government can be trusted with my health data. | Strongly agree | 11 | 8 |
| | Tend to agree | 33 | 28 |
| | Neither agree or disagree | 30 | 35 |
| | Tend to disagree | 16 | 17 |
| | Strongly disagree | 10 | 12 |
| 2. I would like ways to provide more health data in service of the public good. | Strongly agree | 10 | 9 |
| | Tend to agree | 32 | 21 |
| | Neither agree or disagree | 43 | 54 |
| | Tend to disagree | 11 | 14 |
| | Strongly disagree | 5 | 2 |
| 3. In general, I think my health information is well-protected, in both government and the private sector. | Strongly agree | 10 | 12 |
| | Tend to agree | 38 | 30 |
| | Neither agree or disagree | 34 | 34 |
| | Tend to disagree | 12 | 15 |

| | | | |
|---|---|---|---|
| | Strongly disagree | 6 | 9 |
| 4. I worry that my health data could be used against me, such as with applying for private insurance, or that my employers could find out. | Strongly agree | 16 | 15 |
| | Tend to agree | 30 | 34 |
| | Neither agree or disagree | 32 | 31 |
| | Tend to disagree | 18 | 12 |
| | Strongly disagree | 4 | 8 |

Full dataset and demographic breakdowns here. Please contact Andrew McStay if there are any problems accessing the file.