Public dialogue on the ethics of data science in Government

Evaluation Report

Document Status	:	Final – May 2016	
Author	:	**Carl Reynolds**	
Contacts	:	**carl@3kq.co.uk** 07941 249 718	rhuari@3kq.co.uk 07843 258 091 01539 739 435
		3KQ Ltd Pantiles Chambers 85 High Street Tunbridge Wells Kent TN1 1XP	3KQ Ltd 93 Serpentine Road Kendal Cumbria LA9 4PD

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Executive Summary

This report sets out the findings of the evaluation of the Data Science dialogue – covering the preparation and the delivery of the face to face workshops in January and February 2016 and the on-line survey in February and March 2016; governance arrangements, and the lessons learnt and impact of the dialogue. The dialogue had financial and knowledge support from Sciencewise[1], administrative and intellectual support from the Cabinet Office, and specialist inputs from a multi-stakeholder Advisory Group and project management group. The dialogue was delivered by Ipsos MORI and evaluated by 3KQ.

Headline conclusion

The dialogue was delivered well, managed well and had robust structures in place to consider the eventual outputs of the dialogue, learn from them and implement these findings to enhance the Ethical Framework and continue engaging both public and other stakeholders in the Government's use of data science applications.

Context and Aims

The Government Data Science Partnership (GDSP) was set up to promote the use of data science across Government to improve policymaking and services for UK citizens. As the GDS data blog says -

"Data Science combines statistics, programming, machine learning, automatic processing of unstructured data (including text mining) and visualisation[2]."

The aim of the project is to inform further versions of an ethical framework that the GDSP has been developing with departments and external stakeholders. The dialogue project is using face-to-face workshops and an online survey. Cabinet Office (in partnership with a range of stakeholders) wanted to understand how the public responds to the use and potential use of data science and its ethical implications. As the Alan Turing Institute says -

"The extensive use of increasingly more data (Big Data), the growing reliance on algorithms to analyse them and to reach decisions (machine learning), as well as the gradual reduction of human oversight over many automatic processes pose pressing issues of fairness, responsibility, and respect of human rights[3]."

More specifically the GDS identifies the need to build on the earlier stakeholder round table work on an ethical framework by taking members of the public through case studies and the variety of issues that arise from the use of data science approaches. One of the outputs of the evaluation will be to reflect on how the contractor has enabled the public (whether in dialogue workshops or via the on-line survey) to have been able to understand the use of data science and its implications; and to have been equipped to reflect meaningfully on the efficacy of an ethical framework.

Sciencewise is funded by the Department for Business, Innovation and Skills (BIS). Sciencewise aims to improve policy making involving science and technology across Government by increasing the

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[1] Sciencewise is a BIS funded programme to improve Government policy making involving science and technology by increasing the effectiveness with which public dialogue is used. They provide co-funding and specialist advice to help Government Departments and Agencies develop and commission public dialogue. See www.sciencewise-erc.org.uk

[2] https://gdsdata.blog.gov.uk/2015/06/12/getting-started-with-data-science/

[3] https://turing.ac.uk/the-ethics-of-data-science-the-landscape-for-the-alan-turing-institute/

effectiveness with which public dialogue is used, and encouraging its wider use where appropriate. It provides a wide range of information, advice, guidance and support services aimed at policy makers and all the different stakeholders involved in science and technology policy making, including the public. Sciencewise also provides co-funding to Government departments and agencies to develop and commission public dialogue activities[4].

Activities and Content of Dialogue

The dialogue had 7 objectives -

1. To explore, understand and report on the opportunities for data science projects within Government (including what type of data science projects (the public benefit, the type of data used, privacy risks) the public think are appropriate and how these should be overseen

2. To use this insight to inform an ethical framework for departments to use through the detailed analysis, reporting and use of the insights generated by the dialogue

3. Develop and use a number of case studies in the dialogue process to enable participants to explore the ethics of specific data science projects

4. Explore, identify and report on participants' views on future oversight and engagement

5. To create a network of laypeople who could continue to be part of external views on how the Government uses data

6. Create and develop an online survey to create robust qualitative evidence on what the public thinks makes Government data science projects appropriate.

7. To use the survey to create a visual interactive tool which can be used to engage a wider audience in a pubic debate around data science

The project used three different approaches:

Workshops

Several workshops were run:

- a **Pilot** workshop to assess the workability of the materials and approach to the dialogue with nine members of the public;

- two reconvened groups of the public in **Taunton** (26 in round 1 and 26 members of the public in round 2) and **Sheffield** (33 members of the public in round 1 and 31 in round 2); and,

- two reconvened special interest groups – one of **High Data** users in London (10 members of the public in rounds 1 and 2), and one of people with **High Data Interactions** in Wolverhampton (10 members of the public in rounds 1 and 2). The reconvened group is the same group of people meeting twice.

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[4] http://www.sciencewise-erc.org.uk

On-line survey

IpsosMORI used their 300,000+ panel to recruit 2,003 unique users to an on-line survey between February 27th and March 7th 2016. The survey asked people to consider scenarios which illustrated problems faced by Government and to think through their personal responses to differing ways to access and use data. The scenarios tested people's perspectives on data sensitivity, information about individuals, how many people's data would be looked at, how the Government would use the data, whether a person or machine made a decision about the use of data, and how clear decisions were. Participants were shown four of these five scenarios – a potential terrorist attack; train fare evaders; access to employment for young people; experiences of using public transport and healthy lifestyle choices.

Advisory Group (AG)

An Advisory Group (AG), comprising 18 stakeholders[5] from the digital science teams in Government Departments, academics and think tanks, a Sciencewise representative and three people from the GDS, was brought together to support the GDS and IpsosMORI (the delivery contractor) to reflect on the design of the dialogue process and the materials used, review the report and its findings. One member, echoing the feedback from several AG members said, "I was involved in design meetings and making suggestions via the Advisory Group, and I feel I had enough involvement".

This Evaluation

This evaluation covers the seven dialogue objectives, the delivery of the project, its governance, credibility, lessons learnt and emerging impacts. A range of data was employed to evaluate the achievement of these objectives; how the Sciencewise Guiding Principles had been observed; and how some additional issues arising from the Baseline Assessment[6] had been addressed.

Evaluation findings

The evaluation covers the 7 objectives of the project. Of these 7, 6 have been **well met**[7] and one is still to be developed .

Objective 1 - To explore, understand and report on the opportunities for data science projects within Government, including what type of data science projects (the public benefit, the type of data used, privacy risks) the public think are appropriate and how these should be overseen.

The public were provided with ample information, space to understand what data science is, time to discuss their thoughts and reactions to potential applications of data science. Their views on acceptability and appropriateness were also discussed.

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[5] see appendix 4 for names and organisations

[6] appendix 1

[7] appendix 5

Objective 2 - To use this insight to inform an ethical framework for departments to use through the detailed analysis, reporting and use of the insights generated by the dialogue

The dialogue report and reflections by AG members and the GDS have already resulted in amendments to the Ethical Framework; and have other impacts on communications and practice in organisations outside the GDS.

Objective 3 - Develop and use a number of case studies in the dialogue process to enable participants to explore the ethics of specific data science projects.

A number of case studies and examples were worked through with stakeholder and contractor inputs and were observed to enable participants to explore the ethics of data science.

Objective 4 - Explore, identify and report on participants' views on future oversight and engagement.

There was one explicit, but short session on participants' views on future oversight and engagement in the second workshop; and there are a large number of supportive statements for the concept of public engagement in the evaluation forms. There are no concrete proposals for the structure of any future oversight or engagement, but it should be possible for the principles extracted from the workshop sessions to influence this.

Objective 5 - To create a network of laypeople who could continue to be part of external views on how the Government uses data

This objective has not been achieved at this moment in time, but the GDS is using the findings from the dialogue to inform its work on a wider data science social contract between the citizen and the State.

Objective 6 - Create and develop an online survey to create robust qualitative evidence on what the public thinks makes Government data science projects appropriate.

The survey was live between 27th February and 7th March, 2016 and is reported on comprehensively in the IpsosMORI report. Its findings complement and add information to the findings from the face to face workshops. And provide material, via its conjoint analysis and findings to service objective 7.

Objective 7 - To use the survey to create a visual interactive tool which can be used to engage a wider audience in a public debate around data science.

This objective falls outside the remit of the evaluation as specified. But the initial work to develop the visual interactive tool has begun.

The **Sciencewise Key Questions** for evaluation on good practice, satisfaction with the process and successful governance can all be said to be well met. The dialogue was timely and met with a

requirement to develop the Ethical Framework (objective 2), and also followed on from discussions between data scientists and policy makers in Government on the need for Open Policy making and public involvement in the characterisation of the Ethical Framework.

Although the timing for AG members to review materials was short, they were well received, amendments and suggestions were quickly processed; and they supported workshop processes which were engaging and informative. The range of public participants in the room was very diverse in terms of socio-economics, age, gender and ethnicity.

External stakeholders were involved in the AG and contributed to the shaping of the dialogue, reviewed materials and are beginning to disseminate and discuss the findings in their Government Department, via the GDSP and in other organisations.

Participants were **highly satisfied** with the way the dialogue was run and their opportunities to be informed and discuss a range of issues – 147/149 of those returning evaluation forms across both workshop rounds indicated they were *fairly* or *very satisfied* with the *level of information* that they had; and 145/149 said that they were *fairly* or *very well, able to contribute to discussions*.

The **main achievements** of the dialogue are that it has demonstrated that the public participants were able to understand and reflect on the application of data science to Government services; that the public participants and the specialists involved in the project support the continuing engagement of the public, and; that the GDS is willing to use the findings of the dialogue to influence its Ethical Framework.

Impacts on public participants include a better knowledge of the subject and, specifically, how data science can be of public benefit, but also the risks to privacy and intrusion into citizens lives. For the GDS and its stakeholders, the impacts are more about their appreciation of public involvement – as several specialists[8] put it, "*…more aware of the challenges explaining how it all works in practice"*; "*…encouraged me to engage with the public.*"; "*…reinforced the value of engagement."* Although one specialist did remark, "*…we'd never get anything done.*"!

Impacts on **policy** include amendments to the Ethical Framework, intelligence to inform future communications work and emergent developments in other departments and organisations.

The dialogue's **costs** are broadly in line with other similar exercises, and it is intended to have the **benefit** of directly impacting on policy implementation (via the Ethical Framework) this year, as indicated above.

Credibility ratings were high on workshop delivery (specialist and public responses on ability to contribute, level of information and views on involving the public from the evaluation returns); and in post dialogue interviews with a sample of the AG, on the Governance of the project and its methodology.

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[8] from evaluation forms

Several **lessons or suggestions** emerge from the dialogue –

- Lack of dissenting specialists in the dialogue workshops meant that the facilitators had to play devil's advocate, and that no information was imparted by external stakeholders about the risks of data science use by Government. This was mitigated by the public participants raising many issues of privacy, intrusion and suspicions about the use and application of data science.

- The case studies helped to enable participants to address the range of issues surrounding data science, but the context was not always clearly explained and led to some participants misunderstanding the case study on occasion.

- Participants would often respond to the case studies with personal or individual examples of cases which they believed would prove that the use of data science, in that context, was flawed or risky. The evaluator noticed an ongoing misapprehension, in the groups observed, to understand that one point of data among thousands or millions does not disprove the validity of the use of big data. The information on false positives and false negatives, in the second workshop, developed participants' understanding of data usage, but a similar introductory session on data sets, the numbers involved in a data science project and how they are analysed would have aided understanding. This also suggests that GDS will need to review how it communicates data science issues to the wider public; the on-line engagement tool being one avenue.

1. Introduction

This Evaluation Report evaluates the GDS public dialogue on Data Science, commissioned by GDS in December 2015, and covers the period December 2015 to early May 2016. The evaluation considers the quality of the public dialogue process and its preparation; identifies lessons learnt by both participants in the dialogue and those governing the dialogue process; and considers the impact of the dialogue.

2. Background

The policy context

The Government Digital Service (GDS) describes itself as – *"…a centre of excellence in digital, technology and data, collaborating with departments to help them with their own transformation. We work with them to build platforms, standards, and digital services[9]."*

As the current Minister, Matt Hancock says, their work is about - *"recasting the relationship between citizens and the state[10]."*

Government departments are increasingly using and considering the uses of data to enhance and develop new public services. Whilst there are a range of legal requirements which govern the use of data, the emerging field does not have a consistent approach to the use of data and the ethical considerations surrounding it. GDS has been developing an ethical framework for use by departments and this public dialogue was the first opportunity to test public views and values on the use of data by Government and the potential issues and challenges. The analysis of the results of the public dialogue will be –

- used to characterise the guidance in the Ethical Framework;

- develop understanding of how to communicate data science issues to the public, and;

- help to inform and develop a continuing on-line tool for public education on data science.

The public dialogue

The public dialogue was commissioned by the GDS with Sciencewise support in December 2015 via a competitive tender processes. IpsosMORI was selected as the dialogue delivery contractor for both the workshops and the on-line survey of the project; 3KQ were selected as the independent evaluators for the project. IpsosMORI were also selected to deliver Lot B of the tender, which was to provide an ongoing digital platform which used the dialogue findings to develop and characterize further public engagement – the evaluation does not cover an assessment of this.

The dialogue project, including the on-line survey, was jointly funded by the GDS (£10K), GO-Science (£10K), ONS (£20K) and (£90K) Sciencewise, a total of £130K, plus an additional £60K in kind from GDS.

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[9] https://gds.blog.gov.uk/about/

[10] as above

In addition, Sciencewise provided advice and support (including the involvement of a Dialogue and Engagement Specialist - DES) to the value of around £15k. These costs include the governance, delivery and evaluation of the project.

The broad **aim** of the public dialogue was to inform the GDS emerging Ethical Framework guidance for Government Departments to use when characterising new data science projects and applications; to understand the support for ongoing public engagement and/or oversight; and to inform the development of an ongoing on-line public engagement tool.

The specific **objectives of the dialogue** identified by the GDS were:

1. To explore, understand and report on the opportunities for data science projects within Government (including what type of data science projects (the public benefit, the type of data used, privacy risks) the public think are appropriate and how these should be overseen

2. To use this insight to inform an ethical framework for departments to use through the detailed analysis, reporting and use of the insights generated by the dialogue

3. Develop and use a number of case studies in the dialogue process to enable participants to explore the ethics of specific data science projects

4. Explore, identify and report on participants' views on future oversight and engagement

5. To create a network of laypeople who could continue to be part of external views on how the Government uses data

6. Create and develop an online survey to create robust qualitative evidence on what the public thinks makes Government data science projects appropriate.

7. To use the survey to create a visual interactive tool which can be used to engage a wider audience in a pubic debate around data science

IpsosMORI designed and delivered four reconvened public workshops in England throughout January and February 2016; preceded with a pilot workshop to test materials and dialogue processes. This form of engagement was chosen because it allowed the public participants to learn about current and potential data science applications through a combination of information sharing, specialist input to materials and discussions, video, exploratory group tasks and a range of small group and plenary conversations. The workshops were followed by an on-line survey, with a conjoint analysis element, of 2,003 participants in March and April 2016.

3. Evaluation - aims, objectives and methodology

Aims and objectives of the evaluation

The aim of the evaluation is to provide an independent assessment of the public dialogue's impacts and quality, its credibility, and its effectiveness against its objectives. The impacts are specifically how the dialogue informs the Cabinet Office's and its partners' work on the data science ethical framework, but will also resonate on other areas of data science development or use; and whether the Cabinet Office and its partners build on their experience of public dialogue.

There are various specific evaluation objectives that flow from these overarching aims, including:

• To gather and present evidence of - the impacts, as far as is possible within the timeframe of the project; and what the project discovered in terms of public perspectives on data science, the implications of case studies, and thoughts on an ethical framework, in order to come to conclusions.

• To identify lessons from the project to support capacity building across Government, and the wider development of good practice in public dialogue.

The evaluation identifies both the impacts of, and lessons from the dialogue. As requested in the specification it will not assess the personal performance of those involved. The evaluator provided some formative feedback, during the process, but this was minimal due to the quality of the delivery.

The evaluation answers the six key questions, as set out in the ITT and shown below, to provide an overall frame to the work. All these questions were combined in our data gathering methods to provide a mixture of quantitative and qualitative data as appropriate and realistic.

• **Objectives**. Has the dialogue met its objectives? Were the objectives set the right ones?

• **Credibility**. Were the dialogue design, delivery and reporting fit for purpose (appropriate to the context and objectives), and credible with those expected to use the results?

• **Quality**. Has the dialogue met standards of good practice (according to the Sciencewise quality framework and guiding principles? What took place, how, when, where, who with and why? How successful has the governance of the project been, including the role of stakeholders, oversight groups, the commissioning body and Sciencewise?

• **Impacts**. Has the dialogue achieved the expected (and any unexpected) impacts on policy and decisions, on organisational change and learning, and on all those involved? What new insights have been obtained (including on tackling potential social and ethical risks)? Who has seen the results and how have the results been used? What has been the value of the project to those involved, including the extent to which those involved were satisfied with the dialogue outcomes and process?

• **Costs and benefits**. What was the balance overall of the costs and benefits of the dialogue (basic costs compared to benefits, including potential future costs saved)?

• **Lessons**. What are the lessons for future public dialogue projects (including from what worked well and less well)?

Within these six broad questions, are specific metrics - for example, how the results of the dialogue been distributed among policy makers and are extracted from the dialogue by considering –

Objectives – numbers and types of comments from the public on achieving objectives; and the views of the GDS, Advisory Group and Sciencewise on the achievement of objectives.

Good practice – the quality and quantity of workshops, the quality of the on-line survey, did these approaches meet standards of good practice (eg time to reflect and consider ideas), what was the quality of stakeholder engagement.

Satisfaction – numbers and views of the public, specialists and GDS and partners on the process and outputs of the dialogue.

Governance – commentary on what worked and what could be improved?

Impact – what was the influence on policy development paths, levels of understanding by public, observable shifts in partner thinking, what were, or will be, the dissemination pathways?

Costs and benefits – was it a credible spend? Comparator between on-line and public dialogue workshop outcomes and methods in terms of the result? How do funders and other stakeholders see the benefits against the costs?

The evaluation approach and research

An Evaluation Plan[11] was produced by 3KQ, in collaboration with the Sciencewise Evaluation Manager and the GDS at the beginning of the project. The following methods were used to **gather evidence** and **assess** the impacts, achievements and activities of the project -

• Review of documents, emails[12], process design, materials, websites (eg gds.blog.gov.uk) and other communications, to get an understanding of the interactions between the Advisory Group and between the contractor, GDS, and others.

• A review of the Ipsos MORI's final draft report on the dialogue.

• A Baseline Assessment[13] formed after interviewing seven of the Advisory Group, the Sciencewise Dialogue and Engagement Specialist (DES) and the GDS Director of Data.

• Observation of five workshops – the pilot workshop, two workshops in Round 1 and two in Round 2. Observing both the general public workshop rounds in Taunton; the pilot workshop in London and both rounds of the High Tech group in London. This included observations of the form of interactions between the facilitation team and participants (eg how much was a conversation or discussion; and how much was responding to a series of questions); observing the role of the specialists; how material was deployed and used; and how the process was applied.

• Evaluation forms were distributed and analysed for all workshops (see Appendix 3 for compiled scores). 86 out of 88 participants completed an evaluation form in Round 1 and 73 out of 76 in Round 2.

• Observation of an Advisory Group meeting.

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[11] Appendix 2

[12] As of 10 May 2016, there were over 400 emails read or sent by the evaluator.

[13] Appendix 1

• Post dialogue interviews and questionnaires with six of the Advisory Group and the GDS project lead.

Evaluation **evidence** is derived from -

• qualitative data from participants in the workshops or those with oversight (the AG, GDS, Sciencewise), using interview notes, ad hoc conversations, notes of AG meetings, and comments on workshop evaluation forms;

• assessment of the quality of activities and impacts based on analysis of evaluation data from observation and interviews; and

• analysis of the quantitative figures from the tick box questions on the workshop evaluation forms.

The **measures** against which evidence was assessed were -

• Sciencewise seven key evaluation questions on Objectives; Good Practice; Benefits, Value and Satisfaction; Governance, Impact, Costs and Benefits, Lessons for the Future. These were spelt out in the ITT and Sciencewise guidance note SWP07[14];

• Sciencewise Guiding Principles[15]: Context, Scope, Delivery, Impact, Evaluation. These overlap to some degree with the seven questions above.

• Other measures emerging from the Baseline Assessment include how participants understood and reflected on issues raised, including public perception of risk, privacy or legal issues.

One overarching **note** is that what the public participants think of as 'good' or 'excellent' does not always align with the evaluator's own observations or the views of some specialist participants in the dialogue. The evaluator's approach considers the feedback (both quantitative and qualitative) from participants, contractors and the project client to shape their reflections on the achievement of good practice. For the purposes of this Report, the main sources of information are the workshop evaluation forms, email traffic, materials produced for the workshops, the evaluator's own notes of meetings and workshops, and the notes of interviews with AG members.

The evaluator would like to thank staff at GDS, Sciencewise and IpsosMORI for their support and willingness to engage in the evaluation activities.

[14] Sciencewise (2014). *SWP07 Evaluating Sciencewise public dialogue projects.*
http://www.sciencewise-erc.org.uk/cms/assets/Uploads/Evaluation-docs/SWP07-Evaluating-projects-22April15.pdf
[15] Sciencewise (2013). *The Government's approach to public dialogue on science and technology.*
 http://www.sciencewise-erc.org.uk/cms/assets/Uploads/Publications/Sciencewise-Guiding-PrinciplesEF12-Nov-13.pdf

4. The dialogue workshops

This section describes and assesses the **design and delivery of the public dialogue workshops** and covers -

4.1 Recruitment and Sampling

4.2 Specialist input

4.3 Design and Delivery of the Workshops

4.4 Resourcing of the workshops

4.5 Recording and analysis of discussions

4.6 What worked well and less well

4.1 Recruitment and sampling

The recruitment of public participants was undertaken by IpsosMORI using face to face street recruitment. People who had taken part in a dialogue event or any other form of social or market research over the last twelve months were screened out. The quotas considered social grade, age, gender, ethnicity, work status, media literacy and data interactions.

The table below shows the data used for each workshop -

	Recruit	Date 1	Time	Quotas
Pilot London	12 for 10	Wed 20th Jan	6.30pm-9.30pm	**Social grade:** min. 3 AB, 3 C1C2, 3 DE **Age**: min. 2 18-24, 25-40, 41-60, 61+ **Gender**: min 5 F, 5 M **BME:** min. 2 **Working status:** min. 8 working (codes 1-4) min 2 not working (codes 5-13) **Media literacy:** min. 3 High, 3 Med, 3 Low **No. of data interactions:** min. 2 High
1. Sheffield	35 for 30	Sat 23rd Jan AND Sat 20th Feb	10.00am – 4.00pm	**Social grade:** min. 6 AB, 9 C1C2, 9 DE **Age**: min. 8 18-24, 25-40, 41-60, 61+ **Gender**: min 15 F, 15 M **BME:** min. 6 **Working status:** min. 8 working (codes 1-4) Min. 2 not working (codes 5-13). **Media literacy:** min. 9 High, 9 Med, 9 Low **No. of data interactions:** min. 2 High
2. Taunton	35 for 30	Sat 30th Jan AND Sat 20th Feb	10.00am – 4.00pm	**Social grade:** min. 9 AB, 9 C1C2, 9 DE **Age**: min. 8 18-24, 25-40, 41-60, 61+ **Gender**: min 5 F, 5 M **BME:** min. 3 **Working status:** min. 25 working (codes 1-4) Min. 5 not working (codes 5-13) **Media literacy:** min. 9 High, 9 Med, 9 Low **No. of data interactions:** min. 2 High
3. High Tech	12 for 10	Wed 3rd	6.30pm-	**Social grade:** min. 3 AB, 3 C1C2, 3 DE **Age**: min. 2 18-24, 25-40, 41-60, 61+

London		Feb AND Wed 24th Feb	9.30pm	**Gender**: min 5 F, 5 M **BME**: min. 2 **Working status**: min. 25 working (codes 1-4) Min. 5 not working (codes 5-13) **Media literacy:** ALL High **No. of data interactions:** min. 2 High..
4. High data interactions Wolver-hampton	12 for 10	Thur4th Feb AND Thurs 25th Feb	6.00pm – 9.00pm	**Social grade:** min. 3 AB, 3 C1C2, 3 DE **Age**: min. 2 18-24, 25-40, 41-60, 61+ **Gender**: min 5 F, 5 M **BME:** min. 2 **Working status:** min. 8 working (codes 1-4) Min. 2 not working (codes 5-13) **Media literacy:** min. 3 High, 3 Med, 3 Low **No. of data interactions:** ALL High

The public participants were provided with incentives for attending each workshop - £60 for the Pilot in London (evening session); £75 for the first session and £90 for the second session in Sheffield and Taunton (full day events); and, £55 for the first session and £70 for the second session in London and Wolverhampton (evening sessions). A further incentive of £15 was given for completing the homework.

The range of ethnicities, socio-economic group, ages and gender was good and demonstrates a thoroughness in getting the right mixture of people into the workshops.

4.2 Specialist input to the workshops
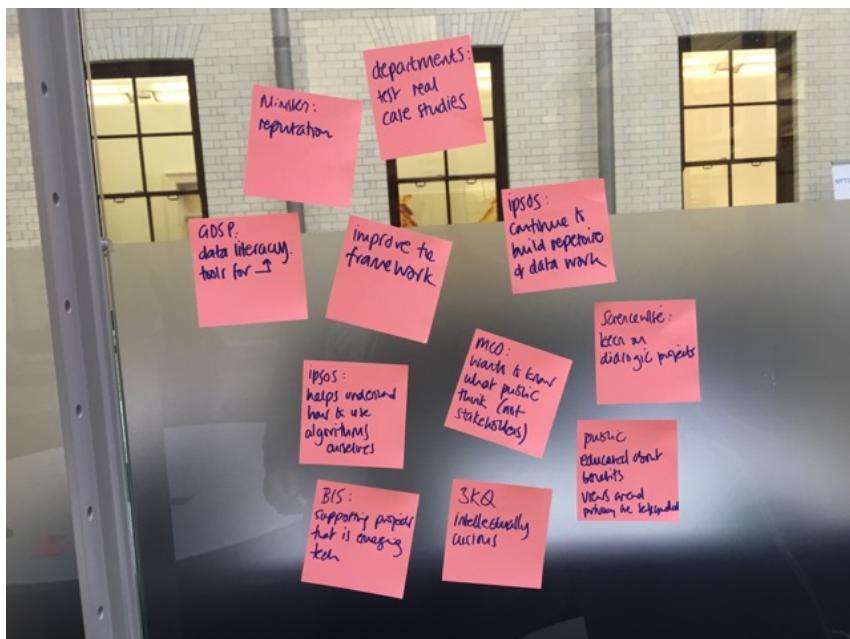
In **advance of the workshops** the AG and the GDS were involved in the production of materials and the design of the workshops. Initial ideas were developed at the Inception Meeting and taken to a subsequent AG meeting (2/12/15) for further discussion.

The purpose of the AG[16] was agreed to be –

Review of materials, understand the evidence from the workshops and survey; contribute to the development of the Ethical Framework; observe and/or participate in dialogue activities, and; take part in evaluation activities.

Given that IpsosMORI had just under four weeks to research, prepare drafts, circulate for comments, revise, re-circulate, get signed off and produce materials, they did an impressive job.

The AG has a review role - enabling the GDS to work with a range of stakeholders to help shape and review the dialogue, but also to contribute to content and review materials. Given the range of organisations[17] represented on the AG (including Government Departments, academics and think tanks) this was a good approach.

Given more time and budget, an engagement with the wider field *might* have produced a larger range of perspectives on the issues being discussed, as a subsequent internet search by the evaluator shows a number of critical voices to the use of Big Data and data science[18]. As one of the contractors said to the evaluator, 'we acted as the critical voice'. The absence of critical voices is mitigated to a large degree by public participant responses in the dialogue around risk, privacy issues, intrusion into personal data, concerns about sharing data across companies and Government, and mistrust of Government intentions.

At **the workshops t**here were two types of specialist input: 1, a **GDS representative** was present at all the workshops and presented information and concepts; and 2, **specialists in the field[19]** participated in the workshop discussions.

Other **specialists** were invited as participants, to be involved in table discussions. They did not present information in front of the whole group, but did contribute facts and occasionally opinions to table conversations and the odd plenary session.

The recruitment of specialists was undertaken by GDS for all the workshops. The specialists included a range from Government policy makers, Government data scientists, private sector data scientists, and academics.

Specialists were briefed in advance to encourage them to participate in discussions without arguing for a particular perspective, and mainly to only contribute to help the understanding of a point being discussed. In the five workshops observed for the evaluation, the **specialists** provided factual information when asked by the facilitator; responded to questions and discussed issues with other participants, and remained neutral and descriptive.

As one specialist observed, "*I don't think I should have contributed my views more – the intention was to find out the views of the public..[20]."*

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[16] agreed at the 2nd December 2015 meeting

[17] appendix 4

[18] eg Open Data Institute – theodi.org; disruptiveproactivity.com – the blog of Sam Smith from Data Confidential; blogs.lse.ac.uk – the LSE social impact blog covers many topics on the use of data

[19] see appendix 4 for list

4.3 Design and delivery of the workshops

The workshops[21] were designed to enable participants to be informed about and then consider their reactions to a range of ideas and proposals. Although the workshops were reconvened with the same public participants, they discussed distinct material at each workshop. The link between workshop one and workshop two was that workshop one introduced people to the concepts of data science and began exploring people's responses to case studies – workshop two considered more case studies, but focused on ethical issues, challenges and other impacts on the public and public services.

Both rounds of workshops were arranged with public participants sitting with one or two specialists, a facilitator and a note taker around tables. Interspersed with the table discussions were presentations to the whole group and plenary discussions.

In **workshop one[22]** -

Participants were -

- Introduced to data science and how Government uses data science in projects to enhance services and its work

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[20] from workshop evaluation form

[21] Detailed process plans can be seen in Appendix 4

[22] there was a concision of these activities in the shorter, smaller workshops

- Enabled to develop an understanding of how Government shared data and why they did

- Considered some data uses and reflected on their responses to them

- Designed a simple data tool to aid transport

- Considered possible uses of data (eg food hygiene inspections, court services, benefit fraud) and gave responses.

- Considered a draft outline for the on-line survey and ideas for the on-line tool

- Evaluation forms were handed out for both public and specialist participants to complete at the end of each workshop.

Between the workshops participants were asked to do **homework**. This entailed thinking about three questions –

1) When did you notice yourself creating, sharing or giving data?

2) When you think data is being collected about you?

3) When you have benefited from data science?

The homework sheet included prompts to remind people of concepts and a contact for help.

In **workshop two** -

Participants –

- Were reminded of why Government is interested in data science and its applications

- Were reminded that one of the purposes of the dialogue was to consider what the public thought were "*the rules of the game for Government when using data[23]*"

- Reviewed their homework and how their thinking had developed

- Were introduced to the ethical issues surrounding use of data and discussed their responses

- Explored the pros and cons of data science applications

- Considered a range of case studies (employment support, unhealthy lifestyles, speed limits, living illegally in the UK)

- Introduced to the concepts of false positives and negatives and how these impacted the design of a data science project; and then discussed how this might impact on a real project

- Shared some thoughts on oversight and further engagement of the public

- Briefly considered the GDS Ethical Framework principles

- As in the first workshop, participants were again provided with an evaluation form and asked to fill this out at tables.

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[23] GDS rep at Taunton – 20.2.16

In terms of the dialogue process conveying the objectives of the dialogue to participants, scores for the **understanding the purpose of the workshops** are very high; suggesting that they were easily conveyed and retained.

Public *understanding of the purpose of the workshops* - (understood it quite well/understood it completely) – Round 1 – 82 out of 86; Round 2 – 73 out of 73 public participants.

On the **design and delivery of the workshops** public participant feedback scored highly on satisfaction with the level of information people had; satisfaction with ability to contribute views, and; the time allowed for discussions across all locations and both rounds of workshops[24] -

- *How satisfied were you with the level of information you had?* – Round 1 – 85 out of 86; Round 2 – 72 out of 73 public participants were *fairly* or *very satisfied.*

- *How well were you able to contribute your views?* – Round 1 – 83 out of 86; Round 2 – 71 out of 73 public participants said *fairly* or *very well.*

- *How satisfied are you with the time allowed for discussions?* – Round 1 – 85 out of 86; Round 2 – 71 out of 73 public participants were *fairly* or *very satisfied.*

These are very high scores and demonstrate how the public appreciated the design and delivery of the workshops. As one public participant said, it was *"easy to understand for a sometimes difficult subject[25]."*

Across both workshops a succession of materials were used to explain concepts and provide information to enable a discussion.

Sciencewise provides a definition[26] of public dialogue as -

"Public dialogue allows a diverse mix of public participants with a range of views and values to:

- *learn from written information and experts*
- *listen to each other, and share and develop their views*
- *reach carefully considered conclusions*
- *communicate those conclusions directly to inform Government's decision making."*

During each phase of the workshops, the facilitators checked people's understanding of the information and concepts being shared with them; clarified agreements or divergent thoughts; and provided time for people to discuss issues and adapt their thinking.

4.4 Resourcing

There were a facilitator and a separate note taker for each discussion group. At the larger events (Taunton and Sheffield) Ipsos MORI deployed three facilitators and three note takers, and at the smaller events (London and Wolverhampton) one facilitator and one note taker.

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[24] From Workshop Evaluation sheet - see appendix 5

[25] From Workshop Evaluation sheet - see appendix 5

[26] sciencewise-erc.org.uk - What is public dialogue?

Participants were split into three groups for the larger workshops; mostly working in separate spaces, but coming together for plenary sessions to understand the key points from other groups. In the smaller workshops, the group worked on one table throughout.

At both workshops plentiful food and drink was provided and there was a friendly and welcoming atmosphere.

The lead facilitator, along with the GDS representative, took responsibility for introducing the process, topics and information. Table facilitators were responsible for facilitating and note takers for recording the discussions in line with the detailed process plan, encouraging all participants to join in the dialogue.

4.5 Recording and analysis of discussion

The discussions were noted on laptops by each note taker, who also used an audio recording device to enable subsequent checking of the accuracy of their notes. The facilitators summarised discussions to check input, and used reflecting and clarifying to check understanding.; as well as posing questions to elicit meaning and prompt discussion on topics.

The workshop also used plenary sessions to capture key points from different group discussions, but the purpose was not to attempt a consensus of views.

4.6 What worked well and less well

What worked well - workshop delivery and design

The range of **information** provided was clear, thorough and enabled participants to grasp a range of complex topics and be able to speak to them with some confidence.

IpsosMORI worked with the GDS, with some commentary from AG members, to design **a process which flowed** from one topic to the next. They had adapted their initial plans for the workshops to take into account the needs of AG members to ensure the case studies were relevant and worked consistently well. This was enhanced by GDS Project Management and regular weekly catch-up meetings and prompt delivery of materials for review. This ensured the materials were fit for purpose in the workshops.

The facilitators and presenters were **clear in their explanation** of materials, tasks and issues for discussion, kept the conversations going and ensured that people were all given the **opportunity to speak**. There were one or two quiet individuals, but the evaluator noted that everyone contributed at some point or another during all the workshops observed.

Specialists themselves said in breaks[27] that they enjoyed the workshops and thought it "*made them think about how they could use external views to help review their work*", and that it was "*fascinating to see how people were able to absorb information and talk about it*".

In **summary**, the design, materials, flow of the workshops, opportunities to contribute and the value in having specialists present was appreciated and worked well. The involvement of the GDS Project

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[27] Informal discussions in London and Taunton

Managers in the design of both the workshop process and the materials used was very good and instrumental in giving the design phase of the dialogue impetus. Especially considering the time constraints of the project, the contractor produced an effective and engaging process.

What worked less well - workshop design and delivery

As mentioned above, an absence of voices critical to the use of data science by Government did not prevent the public themselves raising several concerns about privacy, intrusion and use of data, but it may have been useful to consider in the choice of specialists at workshops. One member of the public[28] commented that *"presenters are clearly on the side of accepting data science…".*

Conclusion

Overall, the design and delivery of the public dialogue workshops was **well done.**

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[28] from evaluation form

5. On-line aspects

This section describes and assesses the **on-line aspects of the public dialogue.**

On-line Survey with conjoint analysis

Sciencewise encourage projects to look at a variety of ways to engage in dialogue with the public. Using Ipsos MORI's panel of 300,000+ people, a representative sample of 2,003 16-75 year olds were selected on the grounds of age, work status, region and gender, and on the basis that this subject was new to them. The questions were co-produced with GDS, with input from the AG and the survey was conducted at the end of February to the beginning of March, using a conjoint analysis approach.

The survey asked people to consider scenarios which illustrated problems faced by Government and to think through their personal responses to differing ways to access and use data. The scenarios tested people's perspectives on data sensitivity, information about individuals, how many people's data would be looked at, how the Government would use the data, whether a person or machine made a decision about the use of data, and how clear decisions were. Participants were shown four of these five scenarios – a potential terrorist attack; train fare evaders; access to employment for young people; experiences of using public transport and healthy lifestyle choices.

The survey highlighted many commonalities, and a few differences, from the findings of the dialogue workshop, and provided insights into the development of an ongoing engagement tool.

Blog

GDS posted a series of blog posts on the project from its outset, including a specialist's perspective from a dialogue events on their experience of the dialogue. The blog posts can be seen at data.blog.gov.uk

8 December 2015. Cat Drew (GDS) On the need for an ethical framework and the upcoming public dialogue - https://data.blog.gov.uk/2015/12/08/data-science-ethics/

10 December 2015 – Paul Maltby (GDS Director) on the use of engagement - https://data.blog.gov.uk/2015/12/10/re-engaging-with-our-external-data-users/

29 January 2016. Madeliene Greenhalgh (GDS) on data science and progress with the dialogue - https://data.blog.gov.uk/2016/01/29/starting-the-public-debate-on-data-science-ethics/

21 March 2016. Adam Beirne (MOD) on public trust in data science - https://data.blog.gov.uk/2016/03/21/public-trust-in-data-science-a-data-scientists-perspective/

Conclusion

The survey helped to draw comparisons with the dialogue workshops' findings; the conjoint analysis added value by illuminating different types of responses from public types and helped to characterise a future on-line tool.

6. Management and governance

This section makes some top line observations of how successful the **governance** of the project has been so far, including the role of stakeholders, Advisory Group, the commissioning body and Sciencewise.

Active and effective project lead. The GDS had two dedicated officers who acted as Project Managers from the beginning of the dialogue. They provided the day-to-day contact for the contractor and evaluator; convened the Advisory Group; initiated, wrote and contributed to presentations and materials at the workshops; recruited specialists for the workshops; attended and presented at workshops; and kept the GDS informed of progress. This role was essential to both the successful running of the dialogue and its supportive activities, and also enabled the GDS to have a deep appreciation of the workings of the dialogue and be 'hands on'.

Effective Advisory Group. Members of the group had the opportunity to provide expertise and share their experience of the issues being covered through the review of workshop materials and process design; and to participate in workshops as observers or specialist participants in discussion. A couple of AG members remarked on the lack of time to engage more deeply, but this is due to the constraints placed on GDS to have the project completed before the Sciencewise project ended at the end of March 2016

Sciencewise support role. The Dialogue and Engagement Specialist from Sciencewise provided support and assistance throughout the project (attending AG meetings, contractor/client meetings, answering emails etc). But due to the end of the Sciencewise funding was unable to comment on the IpsosMORI draft report.

Other stakeholders. As mentioned before, there was an absence of voices critical of the use of data science by Government on the Advisory Group, but subsequent engagement by GDS on the development of the Ethical Framework will engage a wider stakeholder community to gauge views on its approaches to ethics, in particular.

Conclusion

Overall the governance of the project is being **well done**. The AG provided a wide range of perspectives, were active in the consultation on workshop design, provided insightful comments on reports and worked well with the GDS. The GDS project management is knowledgeable, enabling, encouraging and 'on-the-case'.

7. Context

This section addresses whether **the conditions and circumstances leading to the dialogue process were conducive to the best outcomes.** Evaluation assessment is made against Sciencewise Guiding Principle 1 - Context.

Purpose. The project objectives were clear and stayed consistent throughout the project. In addition objectives for each workshop were produced and the AG was clear about its role.

Timing. The need for the dialogue arose out of a need to review the principles and guidance on an Ethical Framework. As one AG member said, "*The timing of the dialogue appears to have been well designed as part of the overall engagement with stakeholders and decision-making process*".

The results of the dialogue have already produced some amendments to the Ethical Framework's guidance; influenced other AG members practice in their respective organisations, and as the GDS project lead said, *"The dialogue results will also feed into wider policy work on a new social contract on data between the citizen and the state".*

Buy-in from policy makers. The GDS is the lead body for producing guidance and policy on data science in Government and is using the dialogue findings to review policy and guidance. It will also use the dialogue findings in discussions with other Government departments on how their case studies impact on respective data science projects.

Wider context. The Snowden disclosures, contention over the care.data proposals and media stories of data theft from banks and telephone companies also contributed to the context within which this dialogue took place. As an AG member said, "*there is a groundswell of interest in this area both in policy and public.*"

Conclusion
The dialogue was timely, contextually appropriate and had considerable buy-in from data science practitioners across Government.

8. Impacts and outcomes

8.1   Dialogue objectives

This section address how and to what extent the **dialogue objectives** were achieved and were they the right ones. Evaluation assessment is made against the Sciencewise evaluation guidance note SWP07 and the Sciencewise Guiding Principles.

Objective 1 - To explore, understand and report on the opportunities for data science projects within Government, including what type of data science projects (the public benefit, the type of data used, privacy risks) the public think are appropriate and how these should be overseen.

Objective 2 - To use this insight to inform an ethical framework for departments to use through the detailed analysis, reporting and use of the insights generated by the dialogue

Objective 3 - Develop and use a number of case studies in the dialogue process to enable participants to explore the ethics of specific data science projects.

The public were provided with ample information, space to understand what data science is, time to discuss their thoughts and reactions to potential applications of data science.

72 out of 73 people scored their satisfaction with *the level of information you had throughout this workshop* as *fairly or very satisfied*. And 72 out of 74 people scored their satisfaction with *how well were you able to contribute your views during the workshop* as *fairly or very well*.

It is clear that the GDS, Advisory Group, and the public participants, feel that the dialogue will be used to inform the GDS's review of the Ethical Framework and the type of data science projects undertaken. 50 out of 72 public responses at the end of the second round of workshops said that the dialogue would have *some or a lot of impact[29]* on *future policy or Government activity in this area*.

The GDS stated, in pre and post dialogue workshop interviews[30] that the dialogue results would influence the Ethical Framework and other Department's approaches to data science projects following feedback on the case studies. The dialogue report and reflections by AG members and the GDS have already resulted in amendments to the Ethical Framework; and have other impacts on communications and practice in organisations outside the GDS.

Members of the Advisory Group had a range of responses to the dialogue findings. Mostly they were positive, including, "*It was really noticeable that a lot of people came not knowing about data science…but over the course of the dialogue they learnt more…",* "*…will help us create a framework that means inappropriate data science projects won't jeopardise wider use of data science*", and, "*it should lead to a more mature debate…*".

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[29] Q9 on Workshop Evaluation Sheet

[30] Interviews with the lead GDS officer, GDS Director

Objective 4 - Explore, identify and report on participants' views on future oversight and engagement.

There was one explicit, but short session on participants' views on future oversight and engagement in the second workshop; and there are a large number of supportive statements for the concept of public engagement in the evaluation forms. This support for engagement ranges across a number of themes, for example,

"it can help eliminate the fear that surrounds it, society focus on the negatives and don't understand the benefits data can have!"

"I think it is very important that the public is made aware and involved in these issues"

"The public's opinion is important on these topics as it's the publics info being gathered."

"Public need an understanding of the issues, the issues are not straightforward"

There are no concrete proposals for the structure of any future oversight or engagement, but the IpsosMORI report suggests how future engagement should be framed[31].

Objective 5 - To create a network of laypeople who could continue to be part of external views on how the Government uses data

This objective has not been achieved at this moment in time, but the GDS is using the findings from the dialogue to inform its work on a wider data science social contract between the citizen and the State.

Objective 6 - Create and develop an online survey to create robust qualitative evidence on what the public thinks makes Government data science projects appropriate.

The survey was live between 27th February and 7th March, 2016 and is reported on comprehensively in the IpsosMORI report. Its findings complement and add information to the findings from the face to face workshops. And provide material, via its conjoint analysis and findings to service objective 7.

Objective 7 - To use the survey to create a visual interactive tool which can be used to engage a wider audience in a public debate around data science.

This objective falls outside the remit of the evaluation as specified. But the initial work to develop the visual interactive tool has begun.

Conclusion

The dialogue either met or contributed to the future achievement of its objectives.

8.2   Influence

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[31] Section 4.3, Data Science Ethics Dialogue, IpsosMORI report, 2016

This section addresses what **influence** on public participants, policy makers other than the GDS and other stakeholders, the dialogue has and will have.

Specific influence on knowledge

The workshop evaluation results reflected a great number of thoughts on what people learnt as a result of taking part[32] in activities –

The **impact of data science** on themselves, for example – *"I am watched/tracked more than I knew", "I need to be much more aware of my personal activities when entering on-line", "I naively was not aware government has access to retail data or even cares about it".*

Improved **knowledge of data science**, for example – *"what data science is and how it is used", "learnt how technology development has impacted data collection and I didn't know it was happening through so many different means", "the use of data for statistics and forecasting trends".*

Ethics and the use of data, for example – *"Learnt more about the complexity of the ethical considerations around the collection and use of big data", "older members of the public were very thoughtful on data security, ethics"," At times it feels like you have to choose between ethical and efficient decisions".*

Influence on specialists

Specialists reported[33], *"a better idea of how the average person interacts with data", "It was very interesting to hear what mattered – and more, what didn't matter to people in my group", "we need to be much clearer when explaining data science to people and specific terms", "quite a lot about what this group thought important and unimportant – not always what I'd expected".*

In post dialogue interviews one AG member also said that the dialogue had resulted in them developing their organisation's code of practice and used a non-specialist to review a recent project; others said that they thought "*some citizen's perspectives were both technically and ethically more mature than either policy makers give credit for or understand themselves*" and "*how nuanced and sophisticated public views were*".

Dissemination

Several AG members talked about how the dialogue results would both contribute to discussions among peers and within and between organisations, but also how it will influence communications plans and how it will inform their potential work on public acceptability around data use.

The GDS is running a stakeholder workshop on 19th May 2016; engaging in further consultation with a wider stakeholders; distributing the report to its Community of Practice of over 300 and its Data

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[32] Q6 – workshop evaluation form – see Appendix 3

[33] Q6 – workshop evaluation form

Leaders Network. They also envisage the findings influencing the development of the Open Policy toolkit.

Conclusion

It is too early to fully understand the depth and range of this dialogue's influence, but it has already impacted the Ethical Framework and altered practice among some AG members.

There is a clear intention to share the findings among peers and build on the findings of the dialogue to enhance communications to the public and stakeholders on data science.

9. Costs and benefits

This section looks at the **costs and benefits** of the dialogue.

As noted above the dialogue has already resulted in the amendment of the Ethical Framework and informed other workstreams among AG members and GDS.

Participants - both specialist and public related both enjoying the process and learning from it. Additionally, they appreciated the thought and consideration put into the design and delivery of the process by IpsosMORI, GDS and others.

For the wider community using or advocating public dialogue, this project is an excellent example of blending qualitative approaches (dialogue workshops) with quantitative methodology (the survey) and having the space to innovate with the conjoint analysis approach.

The dialogue project, including the on-line survey, was jointly funded by the GDS (£10K), GO-Science (£10K), ONS (£20K) and (£90K) Sciencewise, a total of £130K, plus an additional £60K in kind from GDS.

The costs of the dialogue were -

Sciencewise grant	£90,000
GDS cash	£10,000
GO-Science	£10,000
ONS	£20,000
Total	**£130,000**

In addition, GDS provided £60,000 in kind, and Sciencewise mentoring and other support was provided, costing @£15,000.

The design, governance, workshops, materials and products of the dialogue all met their objectives, and the cost of the dialogue is not dissimilar to other Sciencewise projects of similar size.

10. Credibility

Credibility ratings were high on workshop delivery[34] (specialist and public responses on ability to contribute, level of information and views on involving the public from the evaluation returns), 85 out of 86 participants in the first round of workshops were fairly or very satisfied with the level of information they had throughout the workshop. Public comments included, "*can discuss more clearly when clear on info*", "*put over in a way I understood and not made to feel silly*", "*it explained the topic and helped me understand the aim of the day*".

Specialists' attending comments included - "*nice overview and explanation of false positives and negatives led to more focus in some parts of the discussion*" and "*I'm now more confident that ethics form part of the DNA of data science*".

In post dialogue interviews with a sample of the AG the credibility of the report and the approach to the dialogue were cited, along with comments on the added value the dialogue gave to the development of the Ethical Framework; the active engagement of senior Cabinet Office staff; the range of organisations represented on the AG, and; the robust nature of the analysis between the qualitative and quantitative data.

The aforementioned quality of the impacts (section 8), governance (section 6) and context (section 7) and the quality of the delivery by IpsosMORI all contribute to ensuring the dialogue is seen as credible.

Conclusion

The participants, GDS, AG members believe the dialogue will be useful and effective in informing the Ethical Framework and others streams of work. Additionally, the dialogic elements of the project and its governance are all consistent with good practice in the field, as set out by the Sciencewise Guiding Principles.

11. Conclusions

The dialogue met, or is on the process of meeting, all its **objectives**. It will inform the Ethical Framework, provide feedback to departments on their case studies, help shape future communications with the public and is influencing external stakeholders approaches to their own data ethics approach.

The public and specialists appreciated their **engagement in the dialogue** activities and agreed that they were provided with enough information and given enough time to contribute and provide their views on a range of data science themes.

The **experiment** with the conjoint analysis provided insights into the motivation and priorities of the public and gave a few contrasts with the views expressed in the more considered dialogue workshops. And will inform the ongoing engagement tool.

The **design and delivery of the workshops** and survey were of high quality and IpsosMORI, GDS and the AG collaborated well in the design and adjustment of the process. The **pilot** helped to clarify what adaptations were needed to help the public understand data science.

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[34] see Appendix 3 – Workshop Participant Evaluations

The main achievement of the dialogue is its **impact on the Ethical Framework** and how it will help to inform future developments around the use of data in Government and elsewhere.

Other impacts include an appreciation of public understanding of data science; how to engage people effectively; lessons for communicating data science; and the value of using concrete examples.

Appendix 1 - Baseline Assessment

Baseline Assessment

Data Science Ethics – Public Dialogue

January 2016

Introduction
This assessment uses the product of seven interviews with members of the Advisory Group (AG), Sciencewise Dialogue and Engagement Specialist (DES) and Government Data Service (GDS) Head, and is further informed by -

- an overview of the email exchanges between the contractor, Ipsos/MORI, and GDS in the design of materials and process for the dialogue
- an overview of documents produced by parties
- the evaluator's notes from observation at an AG meeting and participation in the Inception Meeting

It is an initial assessment of the thinking and aspirations of the Advisory Group, GDS and Sciencewise for this dialogue. It's principal frame of reference is the objectives for the dialogue, but the subsidiary questions and Sciencewise principles that will characterise the achievement of these objectives in more depth, have also been considered.

Objective 1 - *To explore, understand and report on the opportunities for data science projects within Government (including what type of data science projects (the public benefit, the type of data used, privacy risks) the public think are appropriate and how these should be overseen.*

Interviewees were asked what they considered would be useful to know from the public[35] in understanding what opportunities, and type of project, would be appropriate. Responses ranged from wanting a general understanding of what the public see as acceptable to more specific issues.

Several interviewees said that an understanding of what the public think is *acceptable* and the *boundaries* and edges of this acceptability would enable them to consider the appropriateness of projects and have a *baseline* of opinion. And they were interested in the *difference* between an opinion on an issue that had a direct personal impact and one which was more removed or concerned other people. In *sampling* the 'public' the idea that special groups should be included was reinforced; it was felt important that those people who are underrepresented in opinion forming, but over-represented in terms of who Government has data on should be especially engaged.

Interviewees had worked with Ethics Committees and other interested stakeholders, but working solely with a public group is, fairly, *novel* in this context.

Allied to this was the idea that the public would convey their thoughts on the *risks* of projects, what the potential threats were, and their *fears* and *hopes*. And in doing so highlight any *privacy* or *legal* concerns.

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[35] Using 'public' to mean the public groups engaged with in the dialogue and on-line survey

Interviewees were unanimous in wanting the public to understand *how data works*, is used and the possibilities for use; as well as the methods used to collect and analyse data, for example machine learning and the use of algorithms.

A few people commented on the *timing* of the dialogue being aligned with the production of the Ethical Framework, but also the need to avoid the issues that arose with care.data, and the need to understand public acceptability in a field of remarkably rapid change.

Initial evaluator observations
Interviewees consider the dialogue to be potentially useful and being run at the right time. The objective is broad enough to allow for the iteration of ideas from the public. It's credibility will be informed by how the dialogue addresses and surfaces these issues; and it is clear that the intended impact of the dialogue aligns with the objective.

Key themes to consider in the final evaluation report – how the public's sense of acceptability (and boundaries to acceptability) was brought out and considered; the robustness and credibility of the sampling; were the public asked to consider issues from a variety of perspectives, risks, their hopes and fears, privacy issues; what was novel and learnt from the dialogue; did the public understand how data is used and works, and the method through which this understanding was arrived at.

Objective 2 - *To use this insight to inform an ethical framework for departments to use through the detailed analysis, reporting and use of the insights generated by the dialogue.*

Interviewees were asked how they understood the dialogue would *influence* the ethical framework. No one had a view that this would be an influence that was systematic, but they did believe that the reaction to case studies and how the public's *acceptability* for types of project were framed would be useful in guiding future data projects on what might or might not be acceptable. And that the Advisory Group had a role in shaping how the findings might be used.

Additionally, the *difference* between established ethics practice in the research community and the contrast with what public wants was of interest. The point being made that ethical frameworks for research have a long history of consideration in the research community; and the public may not go through the same process or have the same interests or frames of reference.

Initial evaluator observations
Interviewees are clear that there is no set way for the Ethical Framework to be informed, but that what emerges from the dialogue will be used to consider how the public's thinking will be useful in guiding the framing of future projects. This objective is timely, as the Ethical Framework has been developed, but not yet widely disseminated; and credible as it is specific about the insights gleaned from the public being used.

Key themes to consider in the final evaluation report – what the intended route for informing the framework is and what is planned after the dialogue reports; how ethics as a concept is worked with in the dialogue – what educative and reflective processes are used; what impacts the dialogue has on AG thinking about the use of the Ethical Framework; what was learnt about the approaches used.

Objective 3 - *Develop and use a number of case studies in the dialogue process to enable participants to explore the ethics of specific data science projects.*

Interviewees were asked what kind of approach they would consider effective to enable the public to understand the ethics and use of data involved in differing case studies. The answers had a similar flavour to the responses to Objective 1, but there were some differences.

The difference between the public view and *special interest groups* was highlighted – how similar or divergent were public views from interest groups which, perhaps, purport to *represent* public interest?

There was also an interest in how public opinion is *affected by external events,* for example, how might the hacking of Child Benefit or TalkTalk systems influence people's thinking? And how might people's thinking be explored by using a *personal data journey*, looking at how your data is shared and used throughout the day. Does this impact on how people see levels of *intrusion*, and how comfortable are they with it? And does this differ if it is Government rather than commercial companies using the data?

Initial evaluator observations
The case studies have been constructed to take examples of possible data use from several Government departments, with varying levels of 'intrusion' and with a variety of uses. They have been circulated among the AG for comment and have been amended as a result. As such they will have credibility with GDS and its partners. The desires for how they are used have also been addressed in the process plans for the workshops, as they cover personal and collective data gathering and impact; levels of intrusion and will enable a contrast with the views of special interest groups. This will be further complemented by a specialist re-convened workshop for people with high technological capabilities.

Key themes to consider in the final evaluation report – did the range of case studies embrace enough diversity to provide meaningful feedback in the dialogue report; were the public enabled to distinguish between personal and collective impacts; were other thoughts that emerge from the dialogue's conversations explored to derive more feedback; the extent to which the public views match or differ from those that come from / are expected from special interest groups, and whether and how that is valuable to policy makers?

Objective 4 - *Explore, identify and report on participants' views on future oversight and engagement.*
Objective 5 - *To create a network of laypeople who could continue to be part of external views on how the Government uses data.*

Interviewees were asked their broad thoughts on these objectives and, in the main, said that the idea of a network of laypeople and oversight were good in *principle*, but that the form of this network needed more consideration. The was a willingness to see what *emerged* from the public dialogue and a recognition that it might be harder to recruit to a network like this because the issues were often not of a direct impact or as controversial as say, GM Food.

Initial evaluator observations
Interviewees mainly reflected that the idea was one they supported, but the form and precise function of future oversight and layperson involvement needed more consideration.

Key themes to consider in the final evaluation report – how the product of discussions on these objectives is considered by the AG and GDS and what the intention is, post dialogue, to fulfill this objective.

Objective 6 - *Create and develop an online survey to create robust quantitative evidence on what the public thinks makes Government data science projects appropriate.*
Objective 7 - *To use the survey to create a visual interactive tool which can be used to engage a wider audience in a pubic debate around data science.*

Interviewees were asked about their view on the mix of *qualitative* and *quantitative* data use from the dialogue. Aside from indicating support for this approach there was a concern that the data was not seen as definitive – that the qualitative element of the dialogue was considered with an understanding of its subjective quality. So that quantitative data was used for top line feedback and the qualitative information to provide *detail and depth* for the report.

And there was an interest in how the learning from the use of materials and processes in the dialogue, and in the on-line survey, was used to create the succeeding on-line interactive tool.

Initial evaluator observations
There is wide support from all interviewees with the mix of approaches lending this approach credibility from the outset. Several of the interviewees are conversant with a range of social research approaches and use these methods in their own work. The designer for the succeeding on-line tool is already engaged in project design discussions, demonstrating foresight and the need to have them familiarized with the subject before they design the tool.

Key themes to consider in the final evaluation report – how the analysis of both the on-line survey and the dialogue is used to inform the design and composition of the on-line interactive tool; methods used to sample for the on-line survey, and the resulting sample; the comparison between the results of the on-line survey and the results from the face to face workshops.

Learning aspirations
Interviewees were asked what they hoped to learn from the dialogue. Their responses ranged from the particular – 'I'd like some clear views on our case study' – to the more general interest in what the public find acceptable and what matters to them. And there were several people interested in how the project might influence their own work; comparators with other projects; and the journeys that participants engage on.

Next steps[36]
My next tasks as an evaluator are to –
- observe the Pilot workshop, two special interest workshops and two of the public workshops; produce and analyse evaluation forms (for the public, specialists and observers) from all workshops;
- observe the on-line survey;
- conduct and analyse ad-hoc interviews with participants at the workshops;
- continue to review documents and emails;
- attend Project Management meetings; and

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[36] Detail is available in the Evaluation Plan

review all of this in the context of the the process design and material production activities, objectives of the dialogue and the wider Sciencewise and AG questions from the ITT to produce an Interim Report, about the workshops and survey.

Subsequently I'll be talking to the AG and a few other stakeholders about the dialogue findings and how they are, and will, affecting policy development and their personal and organisational learning about the use of dialogue processes; to inform my final Evaluation Report.

Carl Reynolds
Independent Evaluator, 3KQ
January 2016

Data Science Ethical Framework dialogue – evaluation plan

This is an evaluation plan for discussion and agreement with the Sciencewise Evaluation Manager and Data Science Project Manager, prior to implementation over the coming months by the 3KQ team, led by Carl Reynolds. Comment is also welcome from the delivery contractors, IPSOS/Mori.

Key team members for this project are:

- Rhuari Bennett, 3KQ – project director
- Carl Reynolds, 3KQ – evaluator of the dialogue and associated activities to the end of March 2015.

1. Aims and objectives of the public panel

The Inception Meeting on 2nd December 2015 agreed that the Aims and Objectives of the project (paras 2.1&2.2 in the ITT) would be amalgamated. As of 14.12.15 these were –

1. To explore, understand and report on the opportunities for data science projects within Government (including what type of data science projects (the public benefit, the type of data used, privacy risks) the public think are appropriate and how these should be overseen.

2. To use this insight to inform an ethical framework for departments to use through the detailed analysis, reporting and use of the insights generated by the dialogue.

3. Develop and use a number of case studies in the dialogue process to enable participants to explore the ethics of specific data science projects.

4. Explore, identify and report on participants' views on future oversight and engagement.

5. To create a network of laypeople who could continue to be part of external views on how the Government uses data.

6. Create and develop an online survey to create robust qualitative evidence on what the public thinks makes Government data science projects appropriate.

7. To use the survey to create a visual interactive tool which can be used to engage a wider audience in a pubic debate around data science.

2. Focus of the evaluation

Aim

The aim of this evaluation is to provide an independent assessment of the dialogue[37]'s impacts and quality, its credibility, and its effectiveness against its objectives. The impacts are specifically –

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[37] To include various workshops, an on-line tool and other interactions between stakeholders during the timeframe of the Sciencewise co-funded part of the project.

- How the project influences the content of the Ethical Framework drafted by the Government Data Science Partnership (GDSP).

- How the public influence the type of data science projects undertaken

- How the public influence ongoing oversight and engagement on data science projects

- The impact of the dialogue on the development of the visual interactive tool

Objectives

There are various specific evaluation objectives that flow from these overarching aims, including:

- To gather and present evidence of the impacts, achievements and activities of the dialogue, in order to come to conclusions.

- To identify lessons from the project to support ongoing oversight and engagement in data science and the wider development of good practice in public dialogue and engagement.

Key questions

The evaluation will take into account the five Sciencewise guiding principles and the approach to assessing these described in the Sciencewise quality framework (*Quality in Public Dialogue: A framework for assessing the quality of public dialogue*). These are: context, scope, delivery, impact, evaluation.

The evaluation will also use six key questions, as set out in SWP07: Requirements on Evaluating Sciencewise Projects, to provide an overall frame to our work. All these questions will be combined in our data gathering methods to provide a mixture of quantitative and qualitative data as appropriate and realistic:

1. Objectives – has the dialogue met its objectives? Were the objectives the right ones?

2. Credibility – were the dialogue design, delivery and reporting fit for purpose, and credible with those expected to use the results?

3. Quality – has the dialogue met standards of good practice? What took place, how, where, when, with who and why? How successful has the governance of the project been, including the role of stakeholders, the Advisory Group, the commissioning body and Sciencewise?

4. Impacts – has the dialogue achieved the expected (and unexpected) impacts on policy and decisions, on organisational change and learning, and on those involved? What new insights have been obtained – including social and ethical risks? Who has seen the results and how have they been used? What was the value of the project to those involved, including the extent to which those involved were satisfied with the dialogue outcomes and process?

5. Costs and Benefits – what was the balance overall of the costs and benefits of the dialogue (basic costs compared to benefits, including future costs saved)?

6. Lessons – what are the lessons for future public dialogue projects (including what worked well and less well)?

Within these overarching questions, we will also keep in mind various questions specific to this process. For example:

- how effective and clear were the links between on-line and face to face engagement?;

- how did the overall flow from dialogue to visual tool and to impact/decisions work?;

- how well was public engagement in between activities maintained?;

- how did the various methods of engagement compare?;
- what is the potential for future use of these approaches?

Scope

The evaluation will identify both the impacts of, and lessons from the project. As requested in the tender it will not assess the personal performance of those involved, but it will address the effectiveness of methods used in the dialogue.

The evaluation will consider the project as a whole, covering governance, stakeholder engagement, public dialogue activities, other related public engagement activities (e.g. polls or online surveys), reports from the project, including to public participants, activities to disseminate and use the dialogue results, any other relevant activities affecting the impacts, value and credibility of the dialogue results.

3. Evaluation approach

Overall, the evaluation is focused as much on impacts, influence and lessons for the future as it is on the mechanics of the delivery process although, given the innovative nature of this project, the effectiveness of the methods used in meeting the objectives will also be of significant interest. We intend to provide formative evaluation, feeding constructive advice and reflection directly into the process as it progresses, while being mindful of the need not to slip into 'co-designing' the dialogue.

Given the flexible design of the panel process in terms of the range of potential topics and related methodology, we propose an equally flexible evaluation approach, which involves:

- Allocating sufficient resource to evaluating the overall process and governance, as well as three key aspects: set up and running of the workshops, online elements and the influence on the visual interactive tool.

- Setting aside resource to respond to activities as they arise, particularly where this involves unique or innovative methodologies and 'crossover' methodologies (e.g. a mix of face to face and online methods, qualitative and quantitative methods, etc).

4. Evaluation staging and timeline

There will be three main stages of the evaluation:

- **Baseline assessment – December 2015/January 2016**. An early review of the context within which the project is operating and the expectations of key stakeholders about the likely achievements and impacts, culminating in some early formative feedback. **Output:** Baseline report, for internal use only, 1-2 sides A4.

- **Interim assessment of design and delivery – early March 2016**. Following the completion of the first few months of public activities, a review of the quality of the design and delivery of the process based on the evidence from evaluation research, including feedback from public and other participants (e.g. specialists and other stakeholders). **Output:** Interim report, for internal use only, 8-12 sides A4.

- **Final assessment of the project overall – April 2016**. Following the dissemination of the dialogue project reports, an assessment of the quality of the design and delivery of the dialogue project overall. This will incorporate the findings from the two earlier stages as well as being based on further feedback from those involved. This stage will identify the impacts on those

involved, indicate how the results have been, or will be, disseminated and used to inform policy and decision making, assess the credibility and value of the project results, the value of the project for those involved, and whether the objectives of the project have been achieved. Lessons for the future will also be identified. **Output:** Final evaluation report for publication.

Allowing for flexible evaluation delivery based on panel activities, an initial evaluation timeline is shown overleaf, covering these three main stages and the broad activities occurring between now and the end of the project. Ideally, the contractor's report will be delivered in early April 2016 to allow some time for reflection and potentially some early impacts to become more apparent. Ongoing activities spanning the whole process include:

- Observation/contribution to Advisory Group meetings and project management calls.
- Observation of a selection of workshops – one round each of the reconvened workshops and a sample of the special interest workshops.
- Observation of the on-line survey
- Questionnaires for workshop participants – both public and specialists.
- Formative feedback on activities.
- Document review (including online activity/social media).
- Liaison with key parties.

Indicative timetable

Element	Dec	Jan	Feb	Mar	Apr
1. Inception Meeting	✓				
2. Baseline interviews	✓	✓			
3. Write/agree Evaluation Plan	✓				
4. Baseline Assessment Report		✓			
5. Begin initial evaluation activities - draft evaluation forms, observation of material production and process design, project management, role of the Advisory Group	✓	✓	✓	✓	
6. Other evaluation activities flexible to ongoing process – eg formative feedback		✓	✓	✓	✓
7. Interim Evaluation Report				✓	
8. Impact interviews					✓
9. Analysis and Final Report	✓	✓	✓	✓	✓

5. Evaluation activities in detail

1. Inception meeting – December 2015

This took place on 2nd December 2015 with Sciencewise, the contractor and and two Advisory Group representatives.

2. Baseline interviews – December 2015/January 2016

We will undertake a round of telephone interviews with key stakeholders, including Advisory Group members, GDS members and the delivery contractor. The purpose of the interviews is to explore the perspectives, expectations and assumptions of a mix of project stakeholders with respect to objectives of the engagement, challenges, and credibility. The interviews will feed into the baseline report and will enable the evaluators to revisit these initial expectations and assumptions towards the end of the project. The interviews will be semi-structured to allow for comparison, but also to enable a conversation between the evaluator and the interviewee, which should enable other underlying issues to emerge.

3. Writing and agreeing an evaluation plan – December 2015

This draft evaluation plan sets out the proposed way forward for the evaluation. Once agreed by the Project Manager (following input from Sciencewise), it will become the map to guide 3KQ's work.

4. Baseline assessment report – January 2016

This will be a succinct internal report (1-2 sides), summarising in brief the findings to date. Salient findings are therefore shared as they emerge so that value can be added to the delivery of the project as it unfolds, rather than waiting until the end when it is often too late. The baseline report draws together the results of the baseline interviews and the evaluator's observations of email correspondence and other documents circulated.

5. Initial evaluation activities – December 2015 to January 2016

The evaluator will begin activities by observing and (where appropriate) feeding into Project Management Group meetings, as well as document review where relevant. We also propose providing some more formalised formative feedback on the workshop and survey development as these progress throughout January.

6. Ongoing / flexible evaluation activities – January 2016 to April 2016

Set elements of the panel activity we plan to evaluate are:

- Workshops and survey set up.

- Delivery of face to face dialogue events. Areas covered by the evaluation will include clarity of objectives, sampling and recruitment (specific to each event), incentivisation, stimulus materials, facilitation plan and delivery, participation and interaction, role of specialists, recording, reporting and analysis of public views, and consideration of outputs / impacts.

- Delivery of survey. Areas covered by the evaluation will include clarity of objectives, methodology, drafting of questions, response format, sampling and representativeness, analysis and reporting, consideration of the outputs / impacts, and the integration of survey outputs with the wider process.

- Observations on the transition from dialogue findings to the online interactive tool.

- Overall dialogue activity, including level and quality of engagement, maintenance of engagement, range of topics, methods and impacts.

7. Interim evaluation report – March 2016

We will produce an internal interim report that summarises a review of the design and delivery of the dialogue based on evidence so far. This is a high-level report that sets out an overall assessment of

delivery together with a handful of key learning points, evidenced by observation, participant questionnaires and content owner questionnaires –and interviews.

8. Impact interviews – March 2016

Telephone interviews will be used to explore and understand stakeholders' perceptions of how the dialogue is likely to make a difference to their thinking, learning, actions or decision-making – covering aspects of impact, context, scope and governance. As a comparator we will speak to the same people we interviewed for the baseline assessment to test the extent to which the project met expectations and assumptions.

Interviews will be semi-structured and conducted on a confidential basis, to encourage people to speak freely. Although the content of the interviews will influence the evaluation conclusions and may be reported with quotes where appropriate, they will not be attributed without permission. This will be explained at the start of the interview. Notes made by the evaluators will not be published or passed on.

9. Analysis and final reporting, including impact assessment – April 2016

The data set emerging from the various evaluation elements is a mix of quantitative and qualitative data. It will allow conclusions to be explored, confirmed or amended, and backed up with sound evidence. All detailed analysis reports from individual events will be available to allow disaggregation, and summaries are provided in the first instance.

Ongoing activities

Observation/contribution to Advisory Group meetings and project management calls. We will join Project Management Group calls as an observer and, again, to input where appropriate. And attend at least one Advisory Group meeting.

Observation of a selection of dialogue workshops. We will monitor the process of producing the stimulus materials and developing the plan for each workshop. We initially plan to observe at least four face to face workshop events (this is flexible as project delivery becomes clearer), so we can see how the workshops are framed, introduced, run, and reacted to. Attendance at the events also allows us as evaluators to conduct brief informal interviews to complement the formal exit questionnaires and enable us to comment on the process used. As mentioned above, it may not be resource efficient to observe more than four.

Questionnaires for workshop participants. We will use written questionnaires to collect quantitative and qualitative data from workshop participants (both public and specialists) after each significant engagement activity. In particular, the questionnaire would be focussed on perceptions of the quality of delivery and perceptions of Impact. Participants are asked to respond to a statement using a simple five point Lickert scale (Strongly Disagree to Strongly Agree). This allows rapid completion of the forms with minimal confusion. It also allows the extraction of a variety of useful quantitative metrics. Each question is followed by a "comments" prompt to also enable a qualitative response.

Content owner review questionnaires. We will provide a short questionnaire to be completed by the 'content owner' – the GDS project manager. The questionnaire will explore the content owner's views on the process and outputs, as well as their early views on impacts and usefulness, or what they plan to do with the outputs.

Formative reports on activities. We will provide formative feedback after each significant engagement activity, making recommendations for adaptations (if necessary), key learning points

about the process used and its effectiveness. This includes after each workshop we observe, and for the quantitative survey. We will provide a summary of feedback from any participant questionnaires relating to these kinds of activities.

Document review (including online activity). There are various documents that we will review during the project design and delivery, including: the Terms of Reference of the Advisory Group, stimulus materials and workshop plan for the dialogue sessions, press statements, correspondence with stakeholders, recruitment screener and script, and more broadly the email traffic on the project. We will review reports that cover how information emerging from the dialogue is captured, analysed, reported and used to influence policy and research decisions. We will also review any online and social media activities undertaken as part of the dialogue process.

Liaison with key parties. See 6. below.

6. Liaison

The first point of contact for the evaluation team will be the GDS Project Manager, Cat Drew. All evaluation-related emails will also be copied to the Evaluation Manager at Sciencewise. Key relationships are as follows:

- Project manager: regular telephone and email liaison, project management meetings.

- IPSOS/Mori: liaison regarding project delivery and formative evaluation.

- Sciencewise (Dialogue and Engagement Specialist and Evaluation Manager): ongoing liaison and advice as needed.

- Project Management Group/Advisory Group: attending meetings as observers or to input where appropriate; interviews with members (and other stakeholders as appropriate); occasional specific input.

Carl Reynolds carl@3kq.co.uk 0794 124 9718

Appendix 1. How each public dialogue aim and objective will be assessed

In addition to the indicators in this table, the evaluation will take into account questions within the Sciencewise quality framework (*Quality in Public Dialogue: A framework for assessing the quality of public dialogue*) relating to the five guiding principles, and the key questions described in section 2 above.

Dialogue aim and relevant objectives	Indicators of success	Evidence to be used
To *understand the opportunities* for data science projects, including *what type of data science projects* (the public benefit, the type of data used, privacy risks) the *public think are appropriate* and *how these should be overseen*[38]	GDSP members feel decision making has been influenced GFS members see value and credibility in workshop outputs, and can identify related impacts Dialogue engages a diverse cross section of UK residents A range of activities takes place that allow citizens to engage with GDS plans and decisions on the ethical framework Clear guidance for the visual interactive tool	Content owner questionnaires Baseline and impact interviews Observation of Advisory Groups and workshop events Review of documents relating to workshop recruitment and impacts
To use this insight to *inform* an ethical framework for departments to use through the *detailed analysis, reporting and use* of the insights generated by the dialogue	Views of workshop participants, GDS and other stakeholders tracked and reported GDS members and Advisory Group feel workshop activities involved a sufficient number and type of public	Baseline and impact interviews Workshop participant member questionnaires Observation of workshops

	participants	and online activities
		Review of documents relating to workshop and on-line recruitment and reporting of participant views
	Statements of intent/examples from GDS and Advisory Group members about how dialogue will inform the ethical framework; the distribution of results of the dialogue	
Develop and *use* a number of case studies in the dialogue process to *enable participants to explore the ethics* of specific data science projects	A range of methods and types of case study are used, covering a range of topics/issues	Observation of dialogue activity (face to face and online).
	A report of the public's assessment of the case studies links to ideas for amending (or affirming) the Ethical Framework	Review of documents reporting panel activities and relating to GDS decision making / response to public input
	Statements of intent/examples from GDS and Advisory Group members about how dialogue has influenced other policy problems	Content owner questionnaires
Explore, identify and report on participants' views on future oversight and engagement To *create* a network of laypeople who could continue to be part of external views on how the Government uses data[39]	Lessons about the use of dialogue and the various methods used are drawn together in the contractor's report	Impact interviews Workshop participant questionnaires
	Messages from public participants, GDS members and other	Observation of dialogue activities

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[39] this can only be assessed post dialogue

Create and develop an online survey to create robust qualitative evidence on what the public thinks makes Government data science projects appropriate. To *use* the survey to create a visual interactive tool which can be used to engage a wider audience in a pubic debate around data science[40]	stakeholders regarding the potential and limitations of the dialogue approach are heard and captured, reported and used	Document review relating to dialogue activities and the results of those activities (e.g. reports)

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[40] this can only be assessed post dialogue

Appendix 2. Data gathering, and 'what will be gathered where'

The table below indicates the *primary sources* of data to address the aims and objectives, Sciencewise guiding principles and key questions. This is not to say that other topics would not be included in each data gathering strand.

	Coverage	Baseline and impact interviews	Workshop questionnaires	Content owner questionnaires	Observation	Document review
Objectives	To *understand the opportunities* for data science projects, including *what type of data science projects* (the public benefit, the type of data used, privacy risks) the *public think are appropriate* and *how these should be overseen*	✓	✓	✓	✓	✓
	To *use this insight* to *inform an ethical framework* for departments to use	✓	✓	✓		✓
	To *assess a number of case studies* to *understand how the public view ethics* of specific data science project examples		✓	✓	✓	✓
	To *explore how the public view* ongoing oversight and engagement needs. To *create a network of laypeople* who could continue to be part of external views on how the Government uses data.	✓	✓	✓	✓	✓
	The user interface to turn this online survey into a visual interactive *tool to engage a wider audience* in a public debate around data science.	✓		✓	✓	✓
Guiding Principles	GP1 - Context	✓	✓	✓	✓	✓
	GP2 - Scope	✓	✓	✓	✓	✓
	GP3 - Delivery	✓	✓	✓	✓	✓
	GP4 - Impact	✓	✓	✓	✓	✓
	GP5 - Evaluation	✓				
Key Questions	KQ1 – Met objectives?	As above in objectives section				
	KQ2 – Met standards of good practice?	As above in GP section				
	KQ3 – Value and benefits: satisfaction levels?	✓	✓	✓		
	KQ4 – Governance?	✓		✓	✓	✓

	KQ5 – Impacts?	✓	✓	✓	✓	✓
	KQ6 – Costs, benefits and balance?	✓		✓	✓	✓

Appendix 3 - Workshop Participant Evaluations

Combined scores and comments

Note - The Specialist evaluation forms are worded slightly differently. The main difference is that they ask how they think the public received information. Not all questions are answered - which account for discrepancies in totals between questions.

Round 1

Pilot, Sheffield, Taunton, High Tech, High Data workshops

86 public returns, 6 specialist (P=public, S=specialist)

Comments separated by semi-colons or grouped. Not all options are displayed if there was a nil return. And numbers for sections vary if participants did not complete them.

1. To what extent did you understand the purpose of the workshop?

I did not understand it at all	P=1
I did not understand it very much	P = 3
I understood it quite well	P = 48 S = 1
I understood it completely	P= 34 S = 4

2. To what extent did the workshop cover the topics you were expecting?

I wasn't sure what to expect *Comments* P – questions and answers; I cannot think of anything more; Came in not knowing what to expect	P = 16
Not at all as expected *Comments* P - I'm not sure; I thought it would be a more mundane account of our previous experiences – much more interesting!; Opinion of experiences of public services; I thought the study was about Job Seekers Allowance; More Govt opinions and NHS etc	P = 7
Partly as expected *Comments* P – it covered more than I expected and more depth and information; didn't know what to expect; Data Protection law; Nothing, but interesting; OK with everything, didn't know what to expect; More about data use; Using a computer to gather data; How government can improve public service and general help; More topics and examples were discussed; I wasn't really sure what to expect; I personally thought there would be more questions evaluating how good services currently are, rather than how data is used in improving services; Housing Benefits, Unemployment; the Government website and services S – More direct conversation on ethics/exploring grey areas	P = 24 S = 1
Mostly as expected *Comments*	P = 33 S = 2

P – nothing; n/a; all was covered and kept involved and informed throughout; didn't have any preconceived ideas; views on public spending; aim of the workshop and more background information; possible issues relating to the opportunities for private companies to be given access to data, such as health info; it went into more depth than expected; more detail on the current government activity; the false positive paradox ie the limitations of any statistical test when applied to large populations; None; Data Protection (uninformed!); last bit was awfully rushed; I'm not sure; Specific Gov website pages and the data entered to gain access to them	
S – ideally more case studies, but time constraint is an issue; legalities – commercial data is owned by the company you give it to; Although anonymization and use of commercial data was mentioned, I expected more discussion on them	
Completely as expected	P = 5 S=3

3. How satisfied were you with the level of information you had throughout this workshop?

Not very satisfied *Comments* P - The examples weren't very clear. There seemed to be a lot of conversation on data science rather than asking views	P = 1
Fairly satisfied *Comments* P – info presented was useful on the whole apart from my reservations about false positive paradox; slideshows and graphics contributed a lot; explained well and in basic terms so I could join in; it helped to understand the exercises we had to do; Happy - although some of the case studies were a bit convoluted; Many talking points and perspectives; It was enough information to be able to get involved; helpful insights; most of the information was given, but selectively; paperwork helped explain the context well except about the Hygiene Service not clear if we were discussing the use of data by the agency or to be used by the public; open and honestly; hearing others point of view; pointers given; gave key topics to discuss; discussing subjects; I was not aware before the amount of data that is now collected; I enjoyed the discussion; It gave me pointers and helped the discussion flow; the examples, images and explanations; explained clearly; by taking part, sharing views, listening; S – useful practical examples of outcomes (but not always methods); It was useful to have the explanation of what data science was; one of the case studies was understood in different ways though, confusing the discussion.	P = 34 S = 3

Very satisfied
Comments
P
 	
  • lots of examples to explain each description; very clear aims and objectives initially, then our own responses were facilitated; simple open discussions, but government official leaves too much on gathering data side – sorry!; can discuss much more clearly when clear on info; put over in a way I understood and not to made to feel silly; realizing that so many things are to do with data ie exchanging numbers; helped as I understood what was being asked; gave good understanding; terminologies were explained and examples given; I had no prior knowledge of this subject area and therefore all information was very insightful and clearly delivered; everything was clearly layed out; it explained the topic and helped me understand the aim of the day; Clear examples. Good clarification of questions by the moderators. It made it clear; It enabled me to focus on the issues more and ask relevant questions;
 	
  • clear, concise info, one person speaking at a time; friendly, informal – meant that people were able to speak comfortably; the facilitator gave prompts to help with
	P = 51
	S = 3

discussion, friendly, relaxed atmosphere; prompts, moving on when necessary; felt at ease with the group, sharing opinions; Very stimulating and (I assume) well researched; Very well; They were the reason for the discussion; It was very clear and the explanation by the group leader

- gave me the info to contribute to the discussion; background information and examples helped my understanding; allowed us all to be more informed about the topic; gave concise, basic understanding of topics so that I was able to form an opinion and discuss them; as detailed as needed (generally); it was explained to us, so I understood; I knew very little at the start so anything helped me; the subjects were presented clearly.

S – spending half the day on what data science is was really useful; enough background info given to enable participants to give a rounded view

4. How well were you able to contribute your views during this workshop?

Not very well *Comments* P - Other people have more knowledge on subjects. I understood all. It my views were expressed early on which didn't need repeating; If it was a smaller group as I'm quite shy S – lots of time spent recapping/confirming ate into the time available	P = 3 S = 1
Fairly well *Comments* P - the smaller groups helped a lot and wasn't as intimidating as when I last completed research; - maybe slightly smaller groups; possibly a smaller group, but not necessary; Smaller group; Some time spent in even smaller groups; same sized groups; - Most of my views were pointed out by others in my group; going round the table to hear my views otherwise only the loudest participate; more structure to group discussions; sometimes hard to speak with more outspoken people; - A microphone!! - Nothing; Not sure - a better understanding of technology - By staying awake S – I don't think I should have contributed my own views more – the intention was to find out the views of the public, not specialists.	P = 42 S = 1
Very well *Comments* P - nothing; none; Nothing; N/a (x2); - it was excellent; everyone in the group were given ample opportunity to contribute; group discussion very well facilitated by Daniel; Everyone was supportive; I only worry that I talked too much to let others speak - More info; more in depth scenarios; More time for discussion; Better questions/examples; ask each individually; more examples - Mic on	P = 41 S = 3

5. How satisfied were you with the time allowed for discussions?

Not very satisfied	P = 1
Fairly satisfied	P = 29
	S = 2
Very satisfied	P = 56
	S = 3

6. What did you learn as a result of taking part in these activities?

Comments
Public

General
I saw different opinions; loads; group discussions; how we vary with views as individuals; Still thinking about it!; People's insights; other people's views on data gathering;

Personal impact
I am watched/tracked more than I knew; that data is shared more widely than previously thought; about data science and how I need to be much more aware of my personal activities when entering on-line; the amount of data shared and the impact it has on decisions made in our everyday lives; This has contributed to some reevaluation of my stance on data sharing; It was interesting to think about and discuss data science. It heightened my distrust of current government; I naively was not aware government has access to retail data or even cares about it; They're coming for my Twitter; To come off social media; it made me think deeper; that so much information is out there that I suppose I wasn't entirely aware of; Not a lot as I have an interest in data science anyway; Didn't realise just how much was already used; that a LOT of our data is being used, monitored and shared; Mobile data and data collected in many forms; a more in depth knowledge of data; How various companies can collect data without an individual knowing it is being collected; just how data benefits us – more so than I thought

Improved knowledge of data science
Insight into data science, potential benefits and drawbacks; what data science is and how it is used; what data science is; quite amazed how computers and statistics are advancing; learnt how technology development has impacted data collection and I didn't know it was happening through so many different means; the use of data for statistics and forecasting trends; the complexity of data research; I have learned a great deal more about data science and algarythms?; I learnt a lot about Data Science; better understanding of how it works; that data science is used for big impacting things; simply more ways data science can be used; How data plays such a big part of everyday life; That social media is very relevant and used by Government dept in their data collection; about Twitter and the usefulness of it

Ethics and use of data
Learnt more about the complexity of the ethical considerations around the collection and use of big data; how data science works, impact that data science will have in the UK; what data is used for (eg phone data for bus services improvement), how it can be used positively be used to make changes; how data could be shared in a good and quicker way; how data can be used to help; the amount of data sources; I learned a lot about data sharing and how data is used; the whole world of data science; more about data science; it made me consider how data can be used to improve services; the plus and minus of data collection and how it could help shape the future; further insight into the collection and use of data; about data, the different types and how it is used; I now have a better opinion on sharing data and more insight into what it involves; how data is collected and used; Planning for the future; Learned what was presented, use of data via the Government which I was unaware of; Data usage; The different things the government are trying to help make social issues more beneficial; Public service data and different ways of looking at it; The possibility for future government data; Future direction of government services; That the government make efforts to listen to peoples views slightly more than I thought! Hopefully higher government will take things on board; That everything you do is being monitored; An insight into how data will be used in future; The extent of lack of connective government administration;

S – a better idea of how the average person interacts with data; public views changed on education, more from ethics to effectiveness; the overall awareness of how everyday activities generate data which can be used for other purposes; older members of the public were very thoughtful on data security, ethics, but felt disconnected by tech/mobiles; A lot! It was very interesting to hear what mattered – and more, what didn't

matter to people in my group; we need to be much clearer when explaining data science to people and specific terms

Evaluator comments
Public participants learnt a lot about data science, it's uses and many of them transferred this understanding to their personal circumstances.

Specialist participants appreciated getting a better understanding of both public understanding and public reactions to the information shared.

7a. How has taking part changed your views on data science, if at all?

Comments
P
Use of data
- I think it should be used more to help government; data is essential; more accepting of data sharing if it is used for public benefit; very valuable to more studies than expected (eg restaurant reviews for food inspectors); positive, but should only be used in certain areas; that it has previously unknown benefits; how much data there is and how to use and store it; that data science can be a useful tool to benefit services; I can see more benefits for it if properly regulated, but I still see dangers; Just how clever it is when all works together, but also how intrusive it can be
- that most of the concerns about how it us used can be avoided and that it isn't as scary as it sounds; It's an excellent tool, but there are too many grey areas at this point in time for government to justify using it in some ways; I am in favour of the idea, but still have concerns over specific (irrelevant) data usage. Improved view however; I see the use of it more clearly in terms of data science being usefully 'objective'.
- At times it feels like you have to choose between ethical and efficient decisions; It has opened my mind and opinions on how important data science is and how it can be used for the good/bad, ethically and non-ethically connect.

Personal impacts
- I need to be more aware of technology and acceptable of the fact; taking part has made me more interested in data science and if it can be used to improve our lives; I understand what the processes involved in reaching decisions are now; opened my eyes; I know it exists, I appreciate the impact an individual can have on the world around them; I will put more thought into accepting/rejecting if my data can be used going forward; practically I still feel it has +ve and –ve; I was very unaware of data science – the views I have gained today; no problems; How little thought I have given to the issues; Data science; A little; awareness of it it to form an opinion on accuracy; none; it has made me think more about it; When putting data in always say truthfully; I've realised that there are more purposes and abilities to do things with data science than just using for commercial purposes e.g. catching the spread of disease via Twitter; I was not aware of Data Science before. It was interesting to know about it; A better understanding of data collecting and helping to improve; A better understanding of data collecting and helping to improve.
- Yes (x2); its very good; better understanding of the issue; a little less skeptical; yes, I was quite skeptical before; made me feel more comfortable accepting it; more acceptable; Increase my knowledge; made me more aware of how data is used in different situations and throughout our lives; made me more aware
- Not much; Hasn't changed; Not at all; Not much, I still have the same views I had before; Still pretty much the same; not at all; It has made me think more in depth; it gave me an insight, hasn't changed my view; Not at all; none; not changed, but I am more knowledgeable; it hasn't
- Still thinking about it; need more info to decide; not immediately, but this is a topic that requires much thought and reflection; Reserve opinion until after the 2nd session;
- Scares me; More fearful; It has made me more aware of the potential for good and evil;

Miscellany
- Different people's views;

- Don't like the application of the word 'science'. It's a PR label for a mathematical discipline really;
- Interesting to see where it may be headed.
- I am more interested in how computer programmes are made.

S – not really; no; a little, in how positive many of the people were; hasn't; Govt are fairly well trusted to do DS so long as its done openly and transparently…private sector viewed with suspicion; It has made me think about how it is presented to the public

7b. How has taking part changed your views on public involvement in these sorts of issues, if at all?

Comments
Public
Public involvement
- Feel public involvement is essential; public should have more involvement; made me understand that my views could make a difference; we all have a part in shaping the future and I would like to think the public's opinions are valued; very important for fair views across the board; important that there is public involvement, but time needed to explain and understand what involved; we are considered; that it is a necessity; I think we should participate fully; We still need more public involvement; previously I was not aware that Government considered public opinion to this extent; always a good idea to ask the public their views as they differ from Government sometimes; I feel we need a much greater level of public involvement; I believe the public should be involved – it's their data;

Public education
- I think that the public needs to be educated in the disadvantages as well as the advantages of data science; I still think the public needs to be more involved and educated on the matter; would like more information from Government;

Personal
- Showed me how little people are aware of what people do with their data; It made me more against them in a lot of cases; I was aware of these techniques before, however I have learnt what Data Science is; It made me think; made me more interested; given me an opportunity to hear other views to consider in the future;

Miscellany
- again it has positives and negatives that need weighing up; I would take part on most things; still happy to take part; I am aware of most things; again, a period of reflection is required; changed slightly; positive way; not changed my views, but made me more aware;
- I feel more strongly that people should share their information for the benefit of others; its essential to submit data to help society
- Hearing from a researcher; it made me more aware of how much data companies collect;
- Yes, I need to be more involved in local issues; a bit more empathy with needs
- People need to not think they are being interfered with at all times. Certain things are improved and analysed to help.
- Positive, holistic views gathered and exchange of viewpoints;

Yes, No, a bit
- Hasn't changed; Not at all x2; Not changed; Still the same; No change, none (x2); no (x3); n/a (x3);
- 50/50; Not much; It has not changed very much; not massively;
- yes, more positive; yes, more aware;

S – not at all, I still think public involvement is very important; more aware of the challenges explaining how it works in practice and implications; no difference, always engage; encouraged me to engage with the public; No – I thought it was a good idea and still do.

8. How likely are you to change something as a result of taking part in these activities?

Not at all likely *Comment* P – I have nothing really to hide	P = 13
Not very likely *Comment* P – probably nothing; I am happy to keep sharing!; No difference; I might do more surveys; Perhaps think about where my data is going; Not sure, we shall see; Nothing – our data will be taken whether we like it or not; think I am already quite aware of the dangers in giving out data S – possibly get some input from non-computer scientists/managers on the code of practice for my team (in a computer company) analysing internal data	P = 40 S = 4
Fairly likely *Comment* P • nothing; not much • review my opinions especially on modern technology; will review the privacy settings on all computer equipment that I use; be careful giving my personal details to others ie on-line – fraud; more cautious; learn to understand databases more; think twice about how relevant some data is – read the small print; take care on how I share data; ; Facebook privacy; question data; Simply broaden my views on where I put and use data; Use less of social media; Be a little more wary of who I tell things to online; Stop using Nectar!; be more aware of what I'm sharing in my everyday life; • allow Gov to use data; • More likely to leave my views in response to requests/services S – think about how to do valuable public consultation; improve how I explain data science	P = 30 S = 1
Very likely *Comment* P • be more aware and take part; share data; be open to change; • It will make me more vigilant and politically aware of government policy; Stop using social media and location services.	P = 3

Evaluator comments
The dialogue has prompted a number of people to look at how they share data and use on-line services.

9. How much influence do you think these activities will have, for example to future policy or Government activity in this area?

No impact	P = 5
Not much impact	P = 5
Some impact	P = 37 S = 4

A lot of impact	P = 28 S = 1
I don't know	P = 8

10. Do you have any other comments about the workshop?

Comments
P

- Excellent, well presented, smart, nice to see Government/civil service employees lovely lady!;
- Informal, interesting; well delivered and kept informed throughout; well run; very good workshop; excellent staff, also lunch and refreshments; very informative, good workshop, but at some points felt a bit lost; very interesting and informative workshop; very educational, very patient and intelligent facilitators, enjoyed it a lot, thank you; interesting and though provoking; interesting, informative and well structured; well thought out and very interesting on what might be "on the surface", quite a boring subject. This was a very interesting workshop and very thought provoking; very interesting day and very well organized; amazingly insightful; Very good, look forward to the next workshops; Very interesting discussions; Good workshop. I think some people could have spoken more. Maybe questions can be directed at quieter people in the group; Well run, staff clear, concise and unbiased; very well run and informative; cheerful and friendly; most constructive; excellently lead, enthusiastic but focused team; I thoroughly enjoyed it. It was well run and much more interesting than I had expected; very informative and interesting; was very informative and interesting, enjoyed it a lot; very interesting;
- I feel it could have been a lot shorter, more succinct and clear examples. More encouragement for quieter people to speak. More direction
- Not yet; No (x2);
- Would be interested in hearing the governments view of the ethics of data collection and been able to discuss
- buffet – orange juice, lunch – stick to basics, sandwiches and finger food

S – excellent information provision, but may want to introduce policy angle earlier; very well conducted, unsure about whether the survey is fit for purpose; interesting to see how rural members of the public are concerned about being left out; great facilitation by Naomi – some participants really struggled to articulate their views and Naomi interpreted really well

11. How much of an issue do you think data science is in the UK?

Not an issue at all *Comment* P - Depends on the level of information required and subject field	P = 3
Not that much of an issue *Comment* P - I'm mixed; in my opinion if you have nothing to hide, there is nothing to worry about; as today is the first I've heard of data science, I think it should have a positive impact; - more important things happen; many, many more pressing issues; world markets are something more important – oil, economy; for me personally I am not aware of any issues	P = 12
Quite a big issue *Comments* P *Concern about use of data*	P = 49 S = 3

- many people are concerned as to how Government and big commercial organisations use their data; if in the wrong hands (also lack of knowledge means people are against positive changes); difficulties in balancing the issues of widely available data along with the security that is necessary to protect people; As the data can be used against you; There's a flipside to data sharing. Overall it is happening regardless; With the advance of technology privacy will become an increasing issue; It will have an effect on everything we do, say and deal with; We're at the advent of using and sharing data and many people don't fully appreciate the extent to which their data is being used; It is an issue because it can get out of control, who can monitor data and who can use it; Volume of data on Internet is now so huge it is a big issue for civic society; Because we are giving so much information to different sources; I think if you know about it, it could have a major impact on how the country is run; in our society we need to take stock of privacy and rights to privacy, so this is a big issue as more and more data is being generated and Govt needs to be smart about how they use this; the implications of the possibilities for the manipulation of society are enormous

General
- a growing science!; it's growing and will shape a lot of the future; to help see things differently and improve data;

Need to inform and involve
- public don't understand how data is used and protected; the way technology is developing, it is important to use and explain to the public why it us used and how; I think education is important regarding this; when you understand the impact you appreciate it more; I think people don't know much about it so are very hesitant. Also sometimes choices need to be made about what is the 'right' decision; change social attitudes; Not really understood; unawareness and use of one particular method to implement large social policies

Miscellany
- data is much quicker analysed and put into practice;
- There's so much of it!
- I am not a user of Facebook, Twitter etc and feel that too much time is used on it (them)
- Due to other people's opinions of the data handling process
- Technology is fast paced and changes quickly
- In some areas it is, in others not so much
- Rapid development; more information flowing around; times are changing more and more towards data science

S – once people understand benefits, its not an issue; its going to become standard part of policy making, but the practical impact is still unclear; regularly in the news under different guises….id cards, microchipped wheelie bins, NHS records etc

A big issue	P = 19 S = 2

A big issue

Comments
Public

Privacy and other concerns
everyone is being watched in a way. Our personal details are being held and it is a good thing; Potential is vast for good or evil; Data gathering and its use is all pervasive and affects us all whether we like it or not; For what purpose is it used for and what are the alternative motives?; because it is an area which is rapidly growing, it could be used to improve peoples lives and save money, but mismanaged could cause issues of privacy and Government intrusion; impact of using data incorrectly is huge; Much potential with suitable safeguards; the size and complexity and how this impacts on human life; More data is needed to control the population; I feel a lot of people don't understand it much and it has a huge potential to help people

Miscellany
the speed of completion;

General
its important to use the information, we have to build a better future!! Ignoring it would be a waste!!; this will only get bigger and bigger due to technology available today; the way in which technology is moving; data security – big issue; so much data generated – important how it is used; The internet and connectivity has exploded globally! It's a global issue; It's happening all the time and we don't really understand it

S – data science is next (and current) 'big' thing in changing the way policies are evaluated; high impact. I'm biased, as a data scientist! It has huge potential for social good, is only going to grow, and its important for us to mitigate the risks.

Round 2

Compilation of results from Taunton, Sheffield, High Tech, High Data

73 public (P), 5 specialist (S) returns

A. Context and scope

1.	To what extent did you understand the purpose of the workshop?	I did not understand it at all	I did not understand it very much	I understood it quite well P=35 S = 1	I understood it completely P = 38 S = 4

2a.	To what extent did the workshop cover the topics you were expecting?	I wasn't sure what to expect P = 3	Not at all as expected P = 1	Partly as expected P = 8	Mostly as expected P = 37 S = 3	Completely as expected P= 19 S = 2

2b. What else (if anything) were you expecting to cover?

Public
I was not sure what to expect – was not sure what to expect; just knew it would be about data again; Data protection and policies about selling personal info.

Partly as expected – all OK with what was said; Came with no expectations; Government spending i.e. Public Services; the conclusion of the information being discussed and how it will be used for the future; more governmental aspects

Mostly as expected - Would have hoped to discuss further ideas about data protection and the actual provisions that could be in place; Talk a bit more about the security of personal data and the governments actual plans; This could have been 10 sessions; n/a (x3); mostly covered by above; It covered everything I expected and more; Nothing it was covered

Completely as expected - I learnt a lot and enjoyed the discussions.

S – nothing else, but some topics came up I didn't expect

B. Delivery

3a.	How satisfied were you with the level of information you had throughout this workshop?	Not at all satisfied	Not very satisfied P = 1	Fairly satisfied P = 24 S = 1	Very satisfied P = 48 S = 4

3b. Please tell us how it helped you contribute to the discussions
Not very satisfied - Understood the topic more and could contribute.

Fairly satisfied - The level of information at first was not in depth enough to begin with but that actually helped to deepen the discussion; very much talking in abstract, but level of info was better this time than last time; it helped to clarify the subjects under discussion and hence helped me to contribute appropriately; The lady leading was not very informative, however the man from the Statistics Office was; Very well informed; Gained understanding of Data Sciences which enabled me to participate in most topics of discussion; the man created less tension than the lady (researcher) and we were able to share our ideas;

Very satisfied - Examples and slides; Could take part in useful discussions and raise concerns; Easy to understand for a sometimes difficult subject; It was enough information to be involved in a debate; Very informative, extremely in depth; Felt like it was very open; Nature of the topic is very complicated but I feel it was explained well; simple was able to come to a more informed conclusion about subject matter; it made me interested in what was said; Naomi was both supportive and professionally challenging; powerpoint and handouts were useful; understood what was being asked of us; to focus and understand the task; helped me to be more aware; great amount of info; I understood the topics so felt confident to comment and form an opinion; Was able to voice opinions; Being able to relate to situations; Helped focus discussion and answer some questions / definition; Clear and engaging presenters; Able to voice my opinion; Good having experts to explain another side to specific topics; More use of projectors; Simple, effective, but sometimes forced down a track we have to give information why not!; Having a clear understanding of what Data Science is helps understand the discussions better; It was explained really well which meant that I felt I could join in the discussion as I understood; Everything was explained properly; Understanding of data; I was more informed; Very much hearing people's opinions allowed me to air mine and taking on board people's points; visual prompts; gave valid and real examples to discuss; information was enlightening; it helped me voice my opinion without feeling under pressure;

S - Discussion leader needed better knowledge of issues otherwise reasonably appropriate; nice overview and explanation of false positives and negatives led to more focus in some parts of the discussion

4a.	How well were you able to contribute your views during this workshop?	Not at all well P = 1	Not very well P = 1	Fairly well P = 33 S = 1	Very well P = 38 S = 4

4b. What would have helped you to contribute your views better?
Not at all well – I felt that the group could have been much better managed. 2 dominant voices all the time.
Not very well – the group discussion was not allowing some members to fairly express their opinions – perhaps ask specific individuals questions
Fairly well - I'm not sure; buzzers; I think I did it well enough; I couldn't relate to some situations talked about; more time, less people; all OK; More confident; Smaller groups; Maybe pair work/individuals asked if had low input/some people speaking often; Felt we were under a bit of time pressure sometimes; More time (x2); Background research or information on the subject; More chance to speak.
Very well – Nothing (x3), very satisfied; More time it's a complex and important subject; n/a; I made very valuable contribution which I feel will be very useful; lots of opportunity; A better understanding of apps, Twitter etc; Ask directly individuals, some sat there without speaking; Happy with discussion as it was.

S - it was fine; the fact that the groups were different from the previous workshop was a good idea as there wasn't a data scientist in every group; A structured walk through of what data scientists do. Too much speculation.

5.	How satisfied were you with the time allowed for discussions?	Not at all satisfied P = 2	Not very satisfied	Fairly satisfied P = 31 S = 3	Very satisfied P = 40 S = 2

C. Impacts

6. What did you learn (if anything) as a result of taking part in these activities?

Public

That my view counts; views of the public are listened to; I was not aware that Government consulted the public to such an extent

How much data we give out on a daily basis; Surprised about how much information can be given about oneself; To be more aware of data I'm sharing; Importance of sharing data; How much of my data is shared; Learnt just how much/many occasions data is collected and how we're tracked; made my eyes open about the data we provide; social media is much more relevant in todays society, taken more seriously than I thought;

Heard a lot of different views and learnt a lot of what is behind data gathering; more understanding of the extent of data science; huge amounts as to the extent that data science is used and examples of possibilities; I did understand a lot more about data science; a lot more about different aspects of data; extent and complexity of such programmes; more information; how complex data science is; how different data is applied; what data science is; I now have a clearer and more in depth appreciation of what data science is and how it impinges on our lives; principles of data science – the priorities! Errors in results; More about data science; Possible procedures of future data collecting; That Data Science is shaping the new world; How data is used and shared and who does it and what for; Data Science – tools and methods; What Data Science is and how it is used; What Data Science is about and how regularly its used and impact on my life; What Data Science is; That Data Science is much more far reaching than I originally thought; How data works and why; A lot on Data Science applications; What Data Science is; how involved it is in life; its impact; About data; More knowledge of services used i.e. phones, transport etc; The importance of collecting and the use of personal data; How data is all around and in our daily lives; How much information is out and about; New data systems, ways in which data is collected; The Data Science can be extremely beneficial to my way of life if done correctly; The depth of Data Science (deeper understanding) of how positive data sharing can be; Loads; Data and information awareness; how data could be used as a benefit to the public; I learnt how great data science is; Just how important data science is; how much data is used unknowingly; a more in depth insight into what can be accessed re my data; revolves around technology

Views of the different attendees; differences in opinions and experiences; Learnt to think about some of the issues and "dilemma" in data gathering, maintaining data; Different views on data science can vary with age and life style.

There are policies being created which is good; what to expect going forward and how our views will impact to a certain degree; plans for the use of data science for use by Govt departments; Government still ten years behind policy; I learnt about the government is attempting to balance using social media with ethical considerations; That we are about to create a data monster!; Big brother is watching; Plans are in place without us knowing it; That no matter what the public think, if the Govt want to implement something, they will; How data science helps the Government to collect information in different forms, which they can use to their benefit;

Specialist

That it is inextricably linked from the decision taken at the end; That the public is mostly blind to algorithms in their daily lives!; quite a lot about what this group thought important and unimportant – not always what I'd expected; involve the public. They trust us…remain transparent; breadth of opinion

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7a. How has taking part changed *your views on data science*, if at all?

Public

I feel I have more faith in its purpose and benefit; to be honest and clear; some useful applications; I can see more benefits; slightly more in favour of its uses as I now understand why errors occur more; Positively in most part; Yes – I realised how open and vulnerable the data world is at present; It made me think how I use/share my data; I'm less suspicious of the governments use of my data; It has educated me and made me aware of how much it happens without even realising; I am conscious of it now; It has made me become more aware of what is really going on; It has made me marginally more accepting; Awareness of risk; Much more aware of how all pervasive it is; I am more aware, before I was very ignorant; yes, very much so (x2); by listening to all the fors and againsts; better understanding; given me more opportunity to think about data science; more aware of data use, aware when given etc; more interest in it; it's given me plenty to think about; I know more than I did; More aware of the practice; Awareness of the complexity; I believe it's with good intent but am always a little sceptical about future use; People know a lot more than I realised – an eye opener for me; Interested in other people's views. Very much – there is so many forms of data that I didn't even recognised; that it has pros and cons; same view, but more of an educated one; worried; it kind of feels slightly more to my advantage re government, but has taught me to be more aware on other sites;
I can now see that it could be a useful tool if used in the correct context.
Need to be more aware of technology and data awareness.
I feel I have also become more accepting of my information being used if it was to be of benefit, whereas I would have felt quite protective and more sceptical previously.
I will be more cautious.
Made me think about it a lot more!
Put things into perspective. More happy with it.
Educated me and my thoughts about Data Science.

Well, I didn't now what it was but now I feel quite educated about it.
I was initially very much against the intrusive nature of Data Science, how I am re-evaluating my ideas.
A little.
More open to data use.
Realised the potential impact of how data can be used, sometimes more beneficial than others.
It has a place in society but is not all encompassing.
Worried a computer could decide if I'm a terrorist or not.
Views haven't changed; greater good for greater number.
It's great!
Not at all.
How data is all around and in our daily lives.
I'm more aware of the impact I have as a person every time I share data.
Shown potential, but think it should be an additional feature not a replacement feature.

No; not sure; n/a; not at all; None really; no;!; not at all (x2); not very much;

Specialist
Very little – previous experience in public dialogue taught me a lot already; I'm more confident that ethics form part of the DNA of data science; I don't think my overall views of data science have changed

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7b. How has taking part changed *your views on involving the public* in these sorts of issues, if at all?
Public
Honesty; it can help eliminate the fear that surrounds it, society focus on the negatives and don't understand the benefits data can have!; positive change for the better

As long as everyone is given time to speak it's a robust process

Public should have a say in how their data is stored; by allowing views to be heard

I think it is very important that the public is made aware and involved in these issues; public should be involved; the public should be involved; very much so; very aware of involvement; essential process; should happen more; not much, I feel the public should always be included in discussions; I have always believed the public should be involved; I'm surprised it happens and approve
Not at all; It has not changed that much, but I do feel data collection has its use; They are good, as it is good to guage other people's views and opinions; via social media!; the public's opinions are more important than I thought; didn't realise the public would be involved so much or included in the decision making process; not at all; more understanding; I think it's a good thing;

Made me think more about my views

n/a; not at all; somewhat
Hesitant in involving public.
It hasn't change my views, but I do feel even stronger about how much should be shared.
I think it's extremely positive and shows they care about public opinion.
Other people's point of view.
Can see more benefits but only if data handled correctly and properly.
The public's opinion is important on these topics as it's the publics info being gathered.
I know more about how it's used.
I agree to it.
Very important that the public be involved and aware.
I agree to do it
What you don't know doesn't hurt you. I would question full disclosure as some people would feel it would infringe their civil liberties.
Makes me think deeper about issues.
Public need an understanding of the issues, the issues are not straightforward. It's too easy to say "I've got nothing to hide".
Good to involve public.
More than I was expecting.
Involving the public is satisfactory if it is voluntary, if the need is transparent and actually of it is for the public good.
Well it's a very good idea.
Gained understanding and how if effected society in general.
Think it's crucial public are involved.
It is very important to involve the public.
Public should be involved.
That all sections of the public must be consulted when data is collected.
Saving time with certain issues.

I think public should be discussing these sort of issues at it's in our interests.
I will be considerate of where my data is going.
It has not changed my views, I'm still reluctant.
I think it's a great idea.
Its good they ask the public.
They can be fun and informative.

Specialist
We'd never get anything done; Very important – and that we should provide spaces for wider awareness raising and debate; reinforced value of engagement; all for it; I thought it was a good idea before, now I know it is

8a.	How likely are you to change something you do as a result of taking part in these activities?	Not at all likely P = 13	Not very likely P = 19 S = 1	Fairly likely P = 33 S = 3	Very likely P = 7 S = 1

8b. Please explain what you will do differently (if anything):
Not at all likely – I'm aware and not concerned - at the moment; stay anonymous as much as possible
Not very likely - No comments; n/a; Already quire aware of many issues but will continue to learn and keep updated; Think more about where my data is going when I share it; Not too bothered about the data I share as I don't really have anything to hide; Nothing really, it has only confirmed what I thought anyway regarding Data Science.

Fairly likely - Be more careful with information I share; think more before sharing data; observing more; no different; more concerned about the level of data put in public domain; I'm not sure; not share data willy nilly; be more aware of the implications of my use of the internet; Be more aware of the data I'm giving away.
Take more notice of giving data.
Review choices.
Be even more cautious thoughtful about giving data, ok if the reason is justified and of benefit.
Think about how I answer a question.
Be more careful online with the data I share.
Think before I add my data!
I think more about data I am sharing.
Not share as much info on social media e.g. photos, personal info. Question why data questions are boing asked that seem irrelevant.
I think I will be far less suspicious of releasing personal information – within certain limits.

Very likely - Be more wary; More to ensure my data is limited.
I will think carefully before sharing data.
Need to spend more time, keeping up to date with technology
Be aware.

Specialist
Involve a non-manager/non-technical expert in discussions on ethics of future projects for my team; speak with a more confident understanding on ethics and public opinion; Consider the "communication" issue more – how to explain to public.

9.	How much influence do you think these activities will have, for example to future policy or Government activity in this area?	No impact P = 4	Not much impact P = 9	Some impact P = 31 S = 2	A lot of impact P = 19 S = 3	I don't know P = 9

10. Do you have any other comments about this workshop?
I am sure government will manipulate statistics, put out pacifying statements and do exactly as it likes.
Great workshop – glad to see people trying.
Could go on for a while, a very long topic.
Well run, felt involved.
If you wanted good ideas for data science use in the government I can think of endless but you didn't ask at the start.
I would be willing to do more!!!; very enjoyable experience; very interesting; really enjoyed the sessions – valuable contribution made; just extremely interesting; extremely interesting and thought provoking; I enjoyed it!;

Just to allow everyone to express their opinion evenly during group discussions;

Politicians will drive the policies they want, but I hope this process has been useful;

No; n/a

Very interesting, worthwhile taking part.
Questionnaire could/should be complete midway through the day.
Well done!
Very interesting and eye opening.
Enjoyed content, presentation and how the group leaders allowed/encouraged individuals to contribute. Learnt a lot and much food for thought. Thank you.
Listening about other peoples views especially the younger generation and social media involvement.
Well organised and well facilitated, thanks.
Enlightening, makes you think about what info you are sharing.
It opened up many alternative views and opinions about a number of scenarios.
Very good workshop, if we had more allocated time and wasn't rushed through, it would have been fab.
Thanks for everything.
Excellent and should be made more readily available to the public
Great workshop – feel like your comments may actually have an impact and you may affect future decisions.
Really informative and well run, thank you.
Presenters are clearly on the side of accepting Data Science, making decisions on what's important changing the original questions, I found my opinion wasn't needed, pointless exercise.

Specialist
It was particularly interesting for me – particularly the last session suggesting principles; very well paced and professionally delivered

D. Views on data science

11a.	How much of an issue do you think data science is in the UK today?	Not an issue at all P = 2	Not that much of an issue P = 9	Quite a big issue P = 27 S = 3	A big issue P= 24 S = 2
11b.	**Please explain why you think this** *Not an issue at all* - We need more staff, people to make discussions and be held accountable in government, also target large companies to ensure they pay taxes; I am totally for sharing data to enable a positive outcome for the larger population; Technology is improving and MPs like lining their pockets; it's fabulous!; *Not that much of an issue* - But it will become going forward a big issue; Should be used; It has huge potential and will be beneficial but still needs to be improved and tweaked; Safety and security is of utmost importance; Help to form policies; I am not scared about my data being out there; As I haven't heard of Data Science until now – not enough media on it; it is a necessary evil, you may not agree to it being collected, but it is beneficial when pointed out; *Quite a big issue* - Because it's everywhere and expanding; As people don't know what exactly happening with it because it's a pretty new thing; It can be used to benefit and involve society or sometimes for not great things; because of the way information is gathered; tis the future to be; I think safeguarding is a very big issue; societal development; to be developed; its used a lot with little public understanding; it's a developing method of using data, with time any issue will be covered; when you get people talking about it, it's clear that there's massive misconceptions which should be addressed; I think a lot of people are against it as it hasn't been explained properly and sometimes it can be quite targeted; I think more work is required to get the public more on board with this, it is very much age related; It is a vast topic and everyone has different views; More people should be aware of what happens to their data; It is involved in everything; Quickly developing and many of the public are not yet aware of many issues; Essential for speed in certain circumstances; Different opinions; people are concerned in security of data and why data is stored, what is it being used for; *A big issue* - Because so little is known about it yet – it's new and vulnerable with no laws in place to protect. These issues need addressing; With the climate of world politics with civil wars in various parts of the world, data science can make the world safer. In the right hands. In the wrong hands it could be bad; It's everywhere!; It will change				

everything; this area of science and its capacity is expanding exponentially and it has tremendous capacity to improve lives and save money if well used. If misused it has the dangers associated with the misuse of data; it has the potential for many great effects, but also many negative ones as well; as we get better at data management, the more this area needs to be managed carefully and ethically; it can not only have the potential to do as much good, but equally as much bad; being used and collected all the time. Need awareness of this – what is being collected, what and so what?; its an area that few people have any or much understanding as the potential impact is high; it's becoming a daily occurrence; affects us literally every minute; because its being used to influence everything we do, hopefully to improve services to the public; good and bad of it; it affects every aspect of our lives whether we like it or not, and its use can only increase in the future; Technology moving fast, extremely fast; In order to help with specific projects, e.g. improving health, crime rate etc; So much policy/action/science determined by use of data – important it's understood and used appropriately; Everything points to future technology relying on the collection and correct use of data; Different opinions; Using data for everything; The right wing media report it inaccurately as government spying; The impact it has on our lives; Improvements in technology; because it is needed in some instances

Specialist

Issue in the sense of importance, rather than threat. I'm a data scientist so I'm biased, but there is a huge growth in its use and impact; touches on issues of public concern on policy and decision making; I'm biased! But has a lot of potential to understand major social and policy issues

Public unaware of algorithms being applied so feel outraged when they are told – risk to public trust

Appendix 4 – Advisory Group members and specialists involved in dialogue activities

Advisory Group
External experts: Carl Miller (Demos), Miranda Mowbray (HP)
Public Dialogue: Simon Burral (Involve), Emily Rempel (Bath University), Daniel Start (Sciencewise), Josephine Suherman (Involve), Julie Barnett (Bath University), Peter Mills (Nuffield), Hetan Shah (RSS)
Government: Simon Whitworth (ONS), Dan Edwards (GO-Science), Madeleine Greenhalgh (GDS), David Wilks (GDS), Jacob Seager (Cabinet Office), Peter Knight (DH), Sophie Gerrard (BIS), Graeme Thompson (Cabinet Office), Cat Drew(GDS)

Attendance at dialogues

	No. of public participants	Specialists	
	Actual/Target	Event 1	Event 2 (N/A for Pilot)
Pilot London	9	Participants *Cat Drew,* Government Digital Service, Cabinet Office *Dan Heron*, Government Data Scientist, Cabinet Office Observers *Madeleine Greenhalgh*, Government Digital Service, Cabinet Office *Josephine Suherman-Bailey*, Sciencewise-ERC *Daniel Start,* Sciencewise-ERC *Gemma Hitchens,* Signal Noise *David Wilks,* Government Data Scientist, Cabinet Office *Callum Staff,* Food Standards Agency *Kate McDermott,* Government Data Scientist, Cabinet Office	
Sheffield	Event 1: 33/35 Event 2: 31	Participants *Cat Drew,* Government Digital Service, Cabinet Office *Thomas Oppe*, Information Commissioner's Office *Callum Staff,* Food Standards Agency *Billy Blyth,* Department for Work and Pensions Observers *Emily Rempel*, Bath University	Participants *Madeleine Greenhalgh*, Government Digital Service, Cabinet Office *Adil Deetat*, Office of National Statistics *Thomas Oppe*, Information Commissioner's Office *Billy Blyth,* Department for Work and Pensions Observers *Emily Rempel*, Bath University
Taunton	Event 1: 26/35 Event 2: 25	Participants *Miranda Mowbray*, Hewlett Packard *Madeleine Greenhalgh*, Government Digital Service, Cabinet Office *Adam*, Ministry of Defence Observers *Daniel Start*, Sciencewise	Participants *Miranda Mowbray*, Hewlett Packard *Madeleine Greenhalgh*, Government Digital Service, Cabinet Office *Adam*, Ministry of Defence *Daniel Edwards*, Go-Science Observers *Daniel Start*, Sciencewise-ERC
High Tech London	Event 1: 10/12 Event 2: 10	Participants *Madeleine Greenhalgh*, Government Digital Service, Cabinet Office *Dan Heron*, Governent Data Scientist Observers *Josephine Suherman-Bailey*, Sciencewise-ERC *Adil Deetat*, Office of National Statistics	Participants *Cat Drew,* Government Digital Service, Cabinet Office *Dan Heron*, Gov. Data Scientist Observers *Josephine Suherman-Bailey*, Sciencewise-ERC
High data interactions Wolverhampton	Event 1: 10/12 Event 2: 10	Participants *Madeleine Greenhalgh*, Government Digital Service, Cabinet Office *Adil Deetat*, Office of National Statistics	Participants *Cat Drew,* Government Digital Service, Cabinet Office Observers *Daniel Start*, Sciencewise

Appendix 5 - Calibration and Definitions of Assessments

Very well met	Met to the greatest degree that could be expected. No improvements are identified that could realistically have been implemented.
Well met	Met, with only one or a few relatively small improvements identified, but without any substantive impact on the output of the dialogue.
Fairly well met	Met, but with a series of improvements identified that could have substantively improved the process and/or impact of the dialogue.
Not very well met	Falls short of expectations in a substantive and significant way.
Not met	Effectively not met at all.