

UNDERSTANDING GOVERNMENTS AND CITIZENS ON-LINE:
LEARNING FROM E-COMMERCE

Tobias Escher
Helen Margetts

Oxford Internet Institute
University of Oxford

***Abstract:** Economists studying commercial activity on-line argue that the most significant difference between on-line and off-line commerce is the ability of firms to 'know who your customers are and treat them differently' (Vulkan 2006), customizing prices and offerings. This difference comes from the huge amount of data generated by on-line transactions, in terms of historical records, usage statistics and real-time data. Yet in political life, governmental organizations and political parties have been far slower to use such data to improve their service offerings and devise innovative policy interventions, such as differential pricing and personalized information provision. Likewise, political scientists lag behind economists in terms of analyzing new on-line relationships between citizens and political organizations, for example through the use of experiments and modelling of transaction data. This paper investigates ways in which governments and political scientists might also further understanding of government-citizen interactions, using the results of laboratory experiments where subjects are incentivized to simulate social choices on-line. The findings might be used by governmental organizations to feed into service improvements and policy innovation processes.*

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**UNDERSTANDING GOVERNMENTS AND CITIZENS ON-LINE:
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A significant percentage of citizens now go to the internet first if they want to find information related to government. But where do they go? Do they use government sites prepared for the purpose, or private sector web sites? What type of information is easy to find and which more difficult and does the route affect the ease with which citizens find out what they need to know? Should governments try to control information or should they embrace private sector and volunteer efforts? And if government makes information available to third parties, such as social enterprises, should it keep some label or control on that data?

The internet has 'revolutionised the ability of firms to understand their customers and treat them differently'. It also revolutionises the ability of economists to know what customers are doing: experimental economics is a well developed field and experiments where subjects are provided with computers and interact with each other or an automatic agent is an excellent way to investigate on-line activity. In contrast, so far, the internet seems to have impacted less upon government's ability to know citizens (see NAO 1999, 2002, 2007). Usage of e-government lags behind that of e-commerce (in 2007, whereas 90 per cent of internet users had used the internet to get information about a product or service, only 46 per cent had used it to undertake any kind of interaction with government, including information seeking, Dutton and Helsper, 2007: 73). Furthermore, government organisations seem to be slow to capitalise on the potential of the internet to know more about citizen behaviour. Political scientists too seem to know less about citizen-government on-line interactions, perhaps due to the fact that experimental political science is considerably less developed than that of experimental economics.

So, what do we know about how citizens interact with government on-line? We know that citizens increasingly use the internet to interact with government; this trend is clear and empirically evidenced. For example, the latest survey evidence suggests that 60 per cent of internet users will go to the internet first to find information about their local school or find information on their taxes, up from 40 per cent in 2005, and between 2005 and 2007 the percentage of internet users looking for healthcare information online rose to 68 per cent from 37 per cent (Dutton and Helsper, 2007). These figures are considerably less than for commercial activities such as planning a journey or booking a holiday, but the percentage of citizens who go to the internet first when looking for government-related information is substantial and growing. But we know little about citizens' behaviour once they arrive at the internet. A

growing body of literature looks at how people use the Web and what types of content people view, but such work takes for granted people actually find the content that is evaluated from all the billions of pages available. (Howard and Jones, 2003). Furthermore, in general such work looks at the internet in general rather than government in particular, although there are exceptions (see Hargattei, 2003; Barnes and Vidgen, 2006). As political scientists, we would expect there to be something distinctive about the way citizens interact with government as opposed to other types of organisation; the incentives for both citizens in seeking information and for governments in providing information (they are unlikely to dedicate as much resources, for example, as commercial sites) are different.

This paper argues that the best way to collect this kind of data is by experiment. While surveys can be used to collect initial data, respondents to a survey are unlikely to accurately recall what they 'would do' in a hypothetical situation without being presented with the stimulus of a screen and keyboard. Usage figures can only really be collected from the owner of a web site, and few agencies actually track user data in the kind of detail that would reveal the search paths and behaviour that led them to specific information and clearly ignores those users that found the same information in different locations.

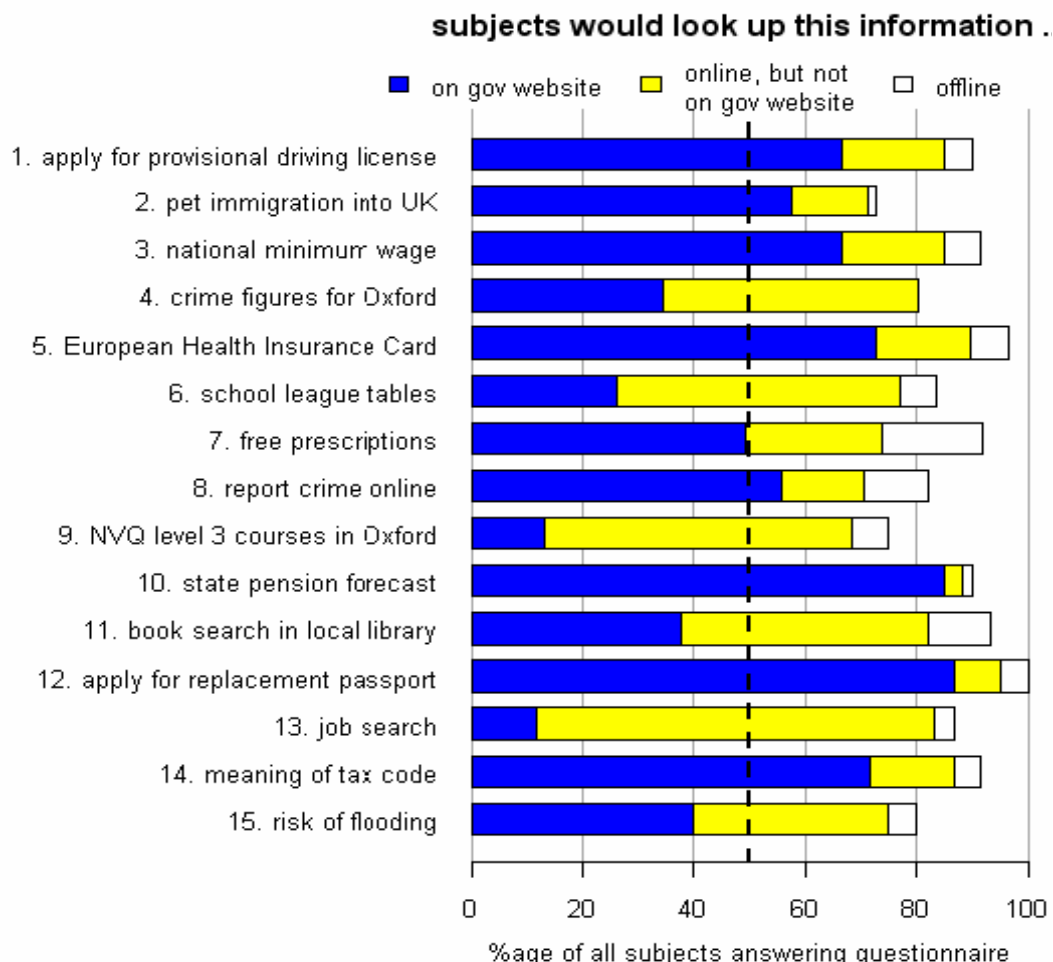
This paper reports on a number of experiments carried out in OXLAB, an experimental laboratory developed by the authors in Oxford. Details of the experiments, including a list of questions, are provided at Appendix A. Basically, subjects were provided with a number of questions to answer, the answers to which we knew to be available on one or more government sites (in particular, the UK government portal, www.direct.gov.uk). Subjects were given an hour to answer as many questions as possible and they were incentivized via a turn-up fee and a small additional fee for each question correctly answered. We carried out two experiments. The first was carried out for a National Audit Office study of UK *Government on the Internet* (NAO, 2007) for which the authors were part of the research team. This experiment explored behaviour under two treatments: first, subjects were allowed to use any method they liked to find the information, and second, they were directed to use the UK government portal www.direct.gov.uk and could use internal but not external search engines. In the second experiment carried out in July 2007, there were also two treatments: one the same as in the first experiments, where subjects could use open search and second, where subjects could do what they like but were given a 'tip' directing them to a government web site.

The following sections detail the main findings from these experiments and other research activities carried out by the authors for a range of studies (see Petricek et al, 2005; Escher et al, 2006, NAO, 2007). A further section considers the policy impact of these findings for e-government initiatives and the provision of government information more generally.

1. The majority of citizens would use the internet first to find government related information, with variations across subject area and topic

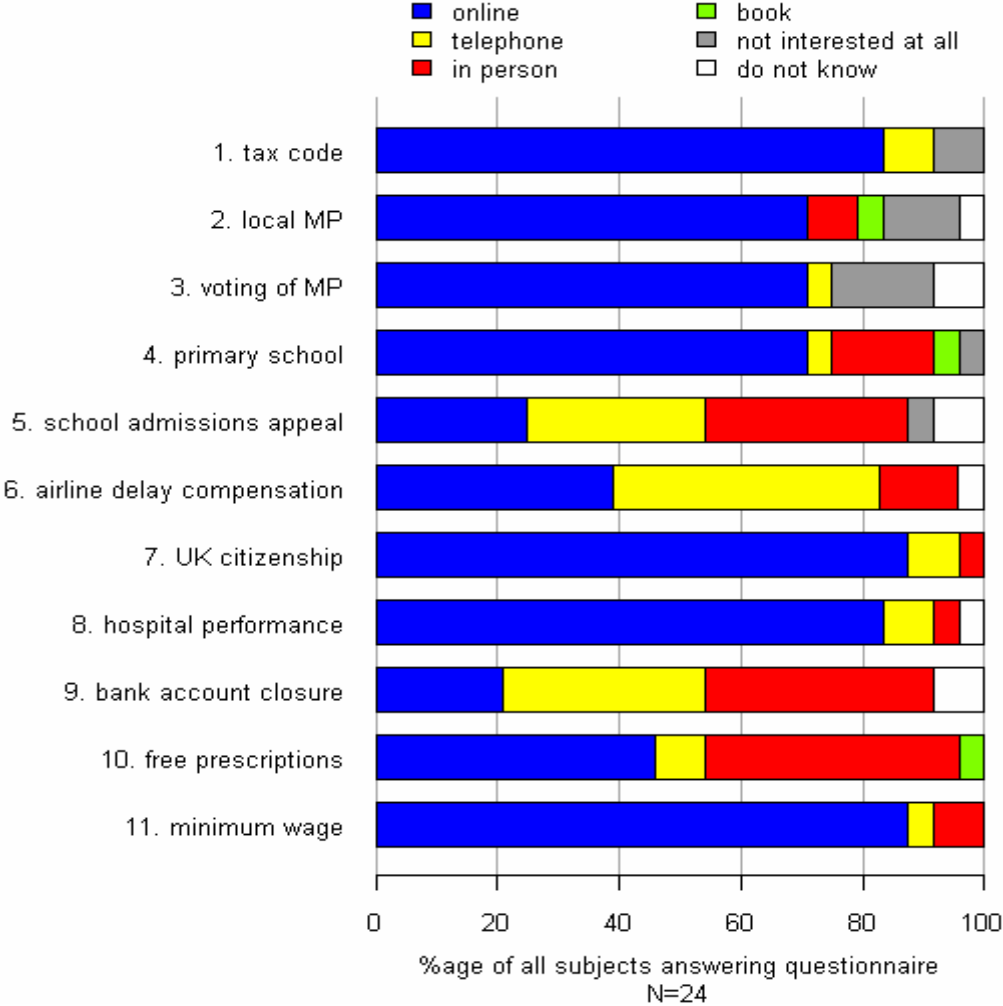
We have some indications to suggest that our questions reflect the type of information that citizens are likely to look for on the internet. In both experiments, we carried out a pre-experiment questionnaire to establish whether the questions asked seemed useful and whether our subjects would be likely to go to the internet to answer them, asking ‘People vary in what kind of information they are interested in and where they look for it. For the following questions: Do you think it is likely you could be in a situation where you would be interested in that kind of information? And if so, where would you go first to find it?’ In both sets of experiments, respondents answered that they would be likely to seek this type of information. For Experiment 1, figure 1 below shows the proportion of subjects claiming that they would look for such information on-line.

Figure 1. Proportions of subjects using the internet to answer questions, Experiment 1



And for Experiment 2, figure 2 below shows where respondents would go to answer the questions.

Figure 2. Where would subjects go to answer questions? Experiment 2



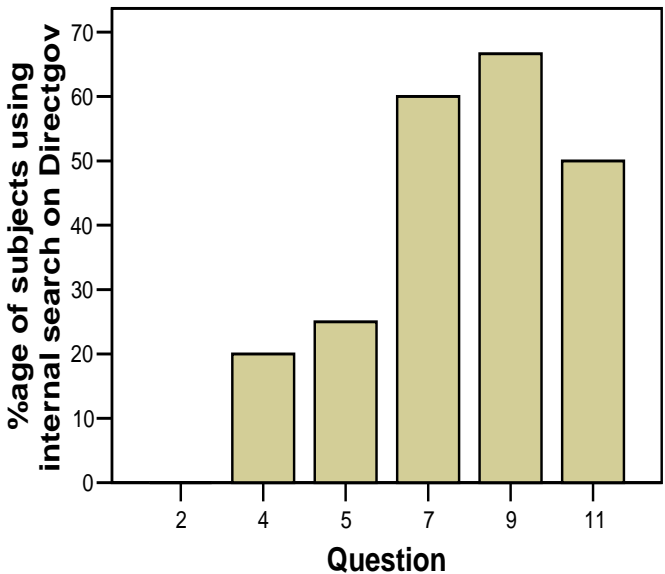
Both figures support the selection of our questions as subjects only seldom said that they would not be interested in this kind of information. While the Internet is by far the most important source of information, it does vary and personal contacts as well as the telephone are important too. It seems that for issues involving some kind of complaint or appeal (school admissions appeal, flight compensation, bank account closure), subjects are more likely to choose telephone or face-to-face contact above the internet.

2. When they get to the internet, most citizens use search, with a wide variety of search behaviour

All our experiments illustrate to which internet users use search engines far more than any other source – and the predominance of Google. In our first experiment, in the open search treatment,

nine out of ten questions were answered correctly with the help of an external search engine (always Google). This is in line with people’s responses to our questionnaire in which they indicated they used search engines very often. In the cross-government site treatment in Experiment 1, the majority of questions were answered with the help of the internal search function (70 per cent), underscoring the high importance of internal search that our subjects also indicated in our questionnaire. In Experiment 2, this figure because subjects had the option to turn to Google, but even here subjects used the internal search facility for 40 per cent of questions for which Directgov was used (both treatments). It was used more often for the last questions (7,9,11) for which it is used by up to 60% of subjects.

Figure 3. Proportion of subjects using the internal search facility on www.direct.gov.uk in Experiment 2

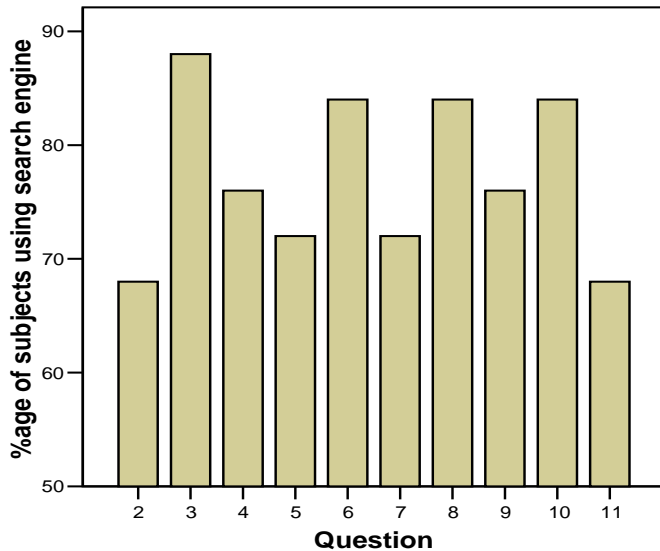


Note: only subjects used Directgov

Our second experiment corroborated the prevalence of the use of search engines in general and Google in particular. Where people were given complete freedom to answer questions, they all used a search engine and this was always Google. Even where subjects were offered a ‘tip’ (that is, the name of the government site where such information could be found) people that used the tip would significantly less often than use a search engine but interestingly, even they did for 60 per cent of cases as apparently they did not find the tip helpful. Overall, for 77 per cent of the questions subjects used an external search engine. The figure below shows a high variation across questions, but still our findings differ somewhat from Hargittai (2001) who found in an earlier study that only 60 per cent of users used a

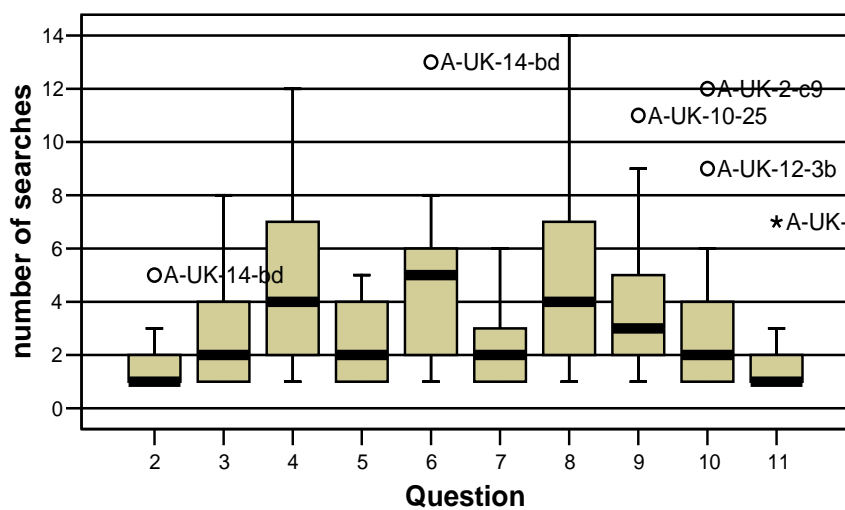
search engine when looking for a tax form, probably indicating a trend towards higher use of search engines over time.

Figure 4. Percentage of questions answered with search engines, Experiment 2



With regard to the *number of searches*, those people that used Google would on average do about 3 searches per question but the box plot shows that this varies for questions. Of 624 searches carried out, only 457 (73 per cent) are for distinct queries while over a quarter are repeated searches with the same terms. This means that people search several times for the same terms to get back to the result list (instead of opening it in a separate window and coming back to it), artificially increasing the amount of searches.

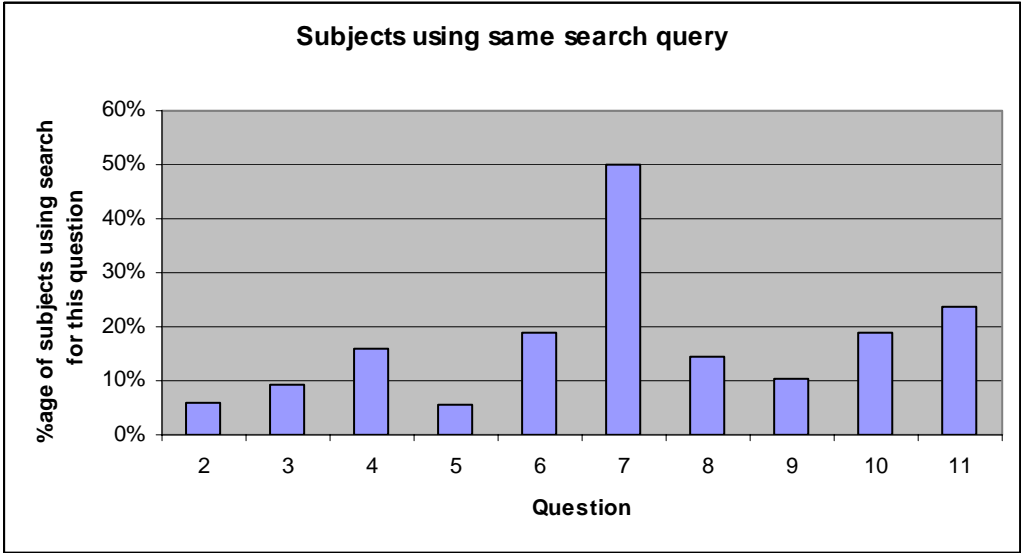
Figure 5. Number of searches carried out per question, Experiment 2



Basically everybody who used the search only looked at the top 10 Google results (first page): 98% of the searches did not go beyond the first page. Of 457 different searches only one would go as far as accessing the fifth page of results (40-50 results).

With respect to *search terms*, there is little similarity for the search queries (combination of terms) subjects were using which came as a bit of a surprise. It seemed that every subject had an individual strategy to formulate search queries. As the following figure shows, there is very little overlap in the search queries in between subjects. Only for question 7 did half of the subjects that did use search use the same query, namely "British citizenship test".

Figure 6. Subjects' use of search queries, Experiment 2



Note: includes only subjects that used search.

However, while the queries are very diverse, breaking these into their constituent words shows that for most questions some words are frequently used in search queries. The following table shows for each question the top 5 terms used in search queries by our subjects:

Table 1. Frequency of words used in search terms, Experiment 2

Question	term	#subjects using term	%age of all subjects searching for this question that used this term
2	m14 7fe	8	47
2	manchester	8	47
2	mp	8	47
2	parliament	6	35
2	member	3	18
3	NAME OF MP	18	82
3	iraq	18	82

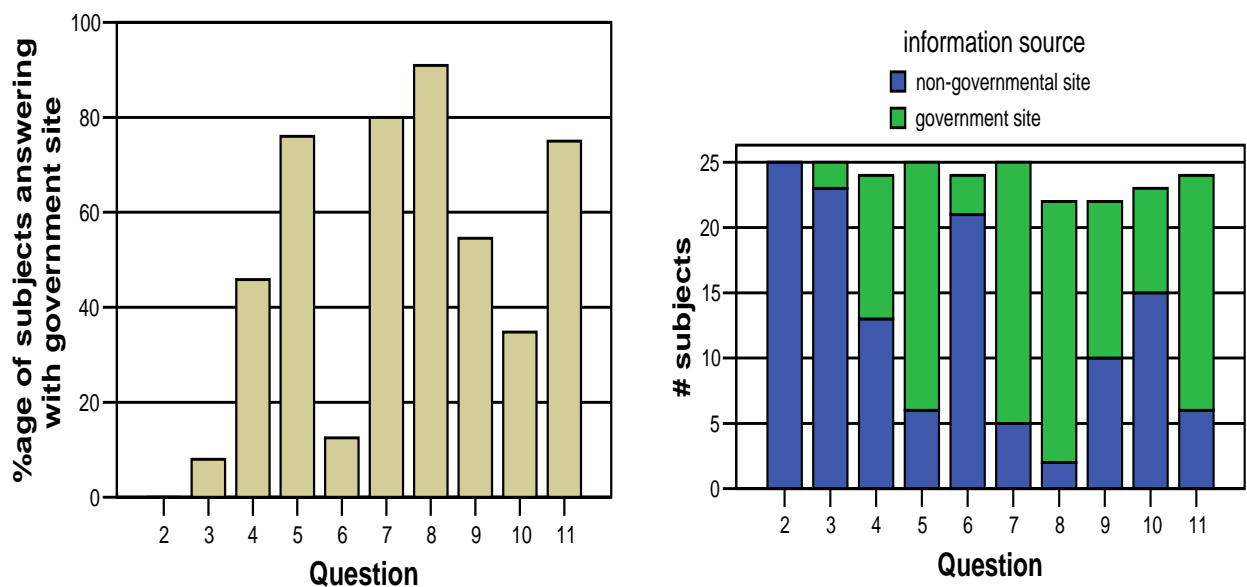
3	sandra	18	82
3	vote	10	46
3	war	10	46
<hr/>			
4	school(s)	19	100
4	primary	17	90
4	m14 7fe	12	63
4	manchester	9	47
4	mile	5	26
<hr/>			
5	school(s)	18	100
5	appeal(s)	13	72
5	primary	8	44
5	admission(s)	6	33
5	decision	5	28
<hr/>			
6	compensation	16	76
6	NAME OF AIRLINE	15	71
6	flight	12	57
6	delay(s)	12	57
6	easy jet	11	52
<hr/>			
7	british	16	89
7	citizenship	15	83
7	test	15	83
7	uk	4	22
7	apply	3	17
<hr/>			
8	hospital	20	95
8	john	20	95
8	NAME OF HOSPITAL	20	95
8	performance	14	67
8	quality	11	53
<hr/>			
9	complain(ts)	14	74
9	bank	13	69
9	NAME OF BANK	10	53
9	account	6	32
9	against	3	16
<hr/>			
10	prescription(s)	20	95
10	free	18	86
10	diabetes	13	62
10	mellitus	11	52
10	right	4	19
<hr/>			
11	minimum	16	94
11	wage	12	71
11	uk	6	35
11	national	2	12
11		21	1
11			6

3. *Governments face a wide range of competition for visibility: citizens frequently find and use non-governmental sources to find government information*

With subjects relying so heavily on search engines, we were interested to see what sources they used to answer the questions; we found that non-governmental sources were often the preferred source. In our first experiment, for those subjects who were free to use open search, almost half (44) per cent were answered with a non-governmental sources. Even in our second experiment, where some subjects had been pointed towards government sites, of all questions, less than half (47 per cent) were answered with the website of a governmental or quasi-governmental body. For obvious reasons (all of our tips were governmental sites), people that followed our tip used significantly more governmental sites (41 vs. 59 per cent). However, even for those people who followed the tip, about 40 per cent of the questions were answered with non-governmental sites.

However, the following diagram shows the huge variation for each question (std. dev is 50 per cent). For some questions (such as the one asking subjects to find the name of their local MP) we found that governmental sources played no role at all. It should be noted that for each question there was usually a clear preference: either the majority was answered with government sources, or the majority was answered with non-government sources. Rarely were both sources equally important for a question (only questions 4, 9, 10). Even the group of people that used the tip (always a government site) would on average find the answer only for 6 out of 10 questions on a government site. Government sources were particularly eschewed for question 2 (local MP) where no subjects used governmental sources, question 3 (vote of MP), as well as question 6 (about compensation for airline delay) and question 10 (about entitlement to free prescriptions).

Figure 7. Sources of information for finding the answers to questions (Experiment 2)



Note: excludes unanswered questions

Table 2 shows for each question individually the percentage of subjects that answered the question with a government sites and the public and private websites used to answer it. In addition, it shows how many of these answers were correct.

Table 2. Sources used to answer questions in Experiment 2.

#	%age Answering with gov sources	Governmental sources			Non-governmental sources		
		Hostname	#	Correct	Hostname	#	Correct
2	0% ¹				upmystreet.com	12	12
					writetothem.com	8	8
					guardian.co.uk	4	4
					bbc.co.uk	1	1
3	8%	parliament.uk	2	1	theyworkforyou.com	7	7
					publicwhip.org.uk	4	3
					NAME OF MP.org	4	4
					arabmediawatch.com	4	4
					stopwar.org.uk	2	2
					guardian.co.uk	2	0
4	46%	dfes.gov.uk	4	4	bbc.co.uk	6	6
		manchester.gov.uk	2	1	google.com	3	1
		ofsted.gov.uk	1	1	yell.com	2	2
		schoolsfinder.direct.gov.uk	4	2	schoolsnet.com	1	0
					upmystreet.com	1	1
5	76%	direct.gov.uk	14	14	bbc.co.uk	4	4
		dfes.gov.uk	2	1	school-guidance.co.uk	1	1
		manchester.gov.uk	2	2	schools-search.co.uk	1	1
		croydon.gov.uk	1	1			
6	13%	europa.eu	3	1	NAME OF AIRLINE.com	12	9
					guardian.co.uk	2	2
					consumeractiongroup.co.uk	1	1
					cph.dk	1	1
					bbc.co.uk	1	1
					oag.com	1	1
					moneysavingexpert.com	1	1
					ukairlineclaims.co.uk	1	1
			answers.yahoo.com	1	1		
7	80%	lifeintheuktest.gov.uk	16	16	bbc.co.uk	1	1
		homeoffice.gov.uk	4	4	workpermit.com	1	1
					ukstudentlife.com	1	1
					ukimmigration.com	1	0

¹ Note, the parliament site has a deal with UpMyStreet so that the company provides the information on “who is your MP”. At the time of our experiment this choice redirected users to the upmystreet website but now it is available from the parliament site.

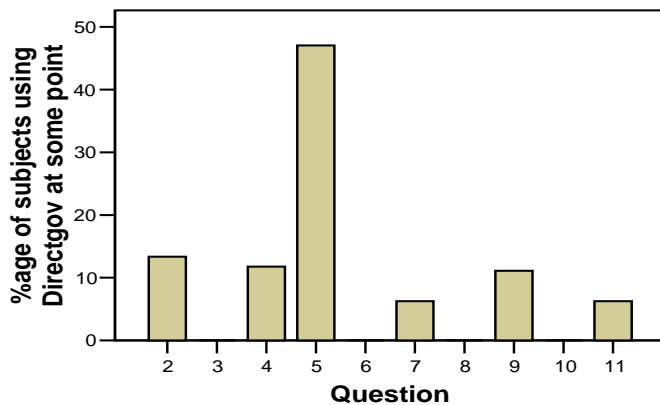
					articlealley.com	1	1
8	91%	NAME OF HOSPITAL.nhs.uk	12	10	patientopinion.org.uk	1	1
		healthcarecommission.org.uk	7	7	privatehealth.co.uk	1	1
		doh.gov.uk	1	1			
9	55%	direct.gov.uk	5	4	NAME OF BANK.co.uk	5	4
		financial-ombudsman.org.uk	4	4	bankingcode.org.uk	1	1
		fsa.gov.uk	2	2	bioa.org.uk	1	1
		federalreserve.gov.uk	1	0	consumeraffairs.com	1	1
					consumercomplaints.org.uk	1	0
					guardian.co.uk	1	1
1	35%	dh.gov.uk	4	1	patient.co.uk	13	13
0		nhs.uk	2	1	diabetes.org.uk	2	2
		centralservicesagency.com	1	1			
		newcastle.gov.uk	1	1			
1	75%	direct.gov.uk	8	8	worksmart.org.uk	2	2
1		hmrc.gov.uk	5	5	is4profit.com	2	2
		dti.gov.uk	4	4	wikipedia.org	1	1
		lowpay.gov.uk	1	1	hrmguide.co.uk	1	1

In general, in Experiment 2 we found little difference in accuracy in answering questions across governmental and non-governmental sources, with the exception of health, where three of the four subjects who used the Department of Health site and one of those who used the NHS site got the wrong answer for the question about prescriptions, while all those who used the privately funded patient.co.uk and a dedicated site for diabetes information got it right.

4. Most citizens tend to rely on external search rather than using the government portal or using a 'tip' for where to find information

The UK government portal, www.direct.gov.uk, is hardly used if people can choose. While it seems that the information is on the site, it is not visible to users of other routes that Google suggests are quicker. In our first experiment (Experiment 1), for those people who could choose their sources of information freely in the open search treatment, Directgov was rarely used in answering the questions. On average, about one out of seven questions (15 per cent) in this treatment were answered by accessing information from Directgov at some point. In our second experiment, subjects that did not use the tip accessed Directgov on average only for one in ten questions. As the following figure shows, question 5 (appeal against school admission) was the most popular question for which subjects accessed Directgov at some point. For most of the other questions, it was basically unimportant.

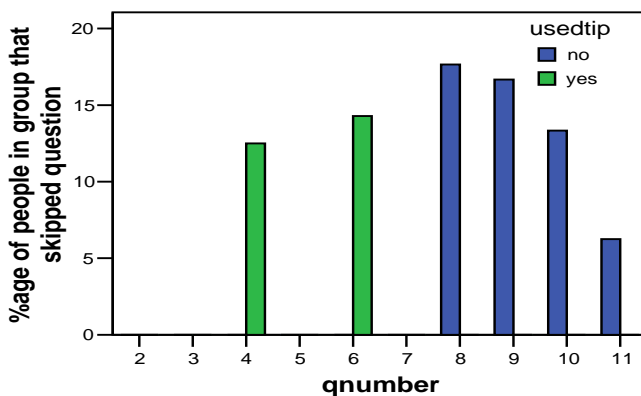
Figure 8. Proportion of subjects that accessed government portal, Experiment 2.



Note: only subjects that did not use the tip

In Experiment 2 where subjects in one treatment were offered a 'tip' (which was quite often Directgov but also the UK parliament site and a European Union site), there was quite a good take up of the advice in treatment B with a median of 7.5 out of the ten questions for which people clicked on the advice. However, subjects were far less likely to use the tip to answer the question: the median is only 3 questions out of 10. There was considerable variation across questions. For example, in question two for the MP of an area in Manchester, while 80 per cent of the people used the advice parliament.uk, none of them answered the question with the help of the parliament website. As shown clearly in figure 9, those people that used the advice had problems with a different set of questions (4 and 6) from those that did not use the advice (8, 9, 10, 11). Those using the tip accessed Directgov on average only for one in ten questions. It was unimportant for all questions apart from 'appeal against school admission'

Figure 9. Percentages of subjects skipping questions across treatments

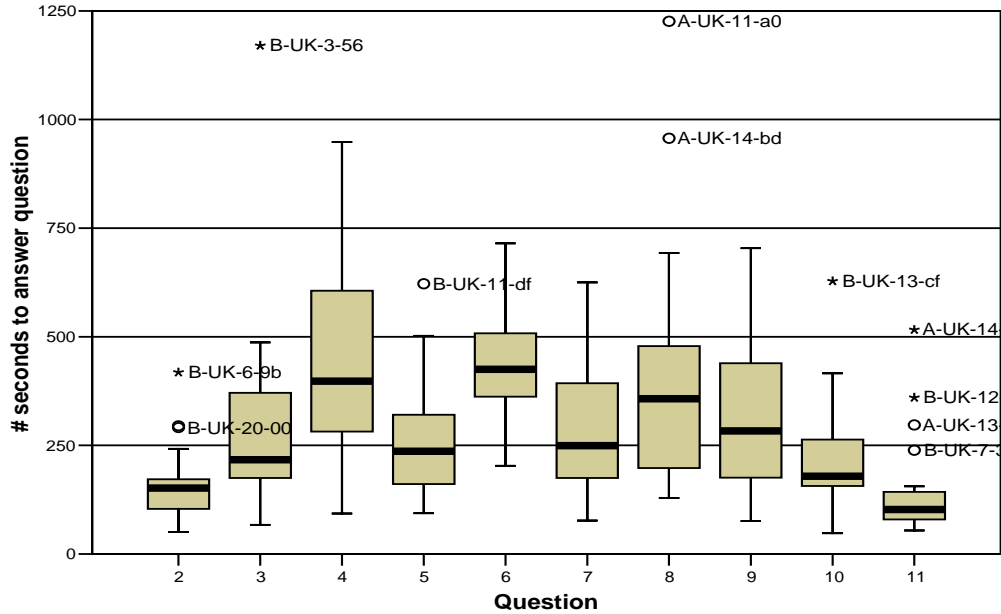


5. There is a high variation in the ease with which questions were answered.

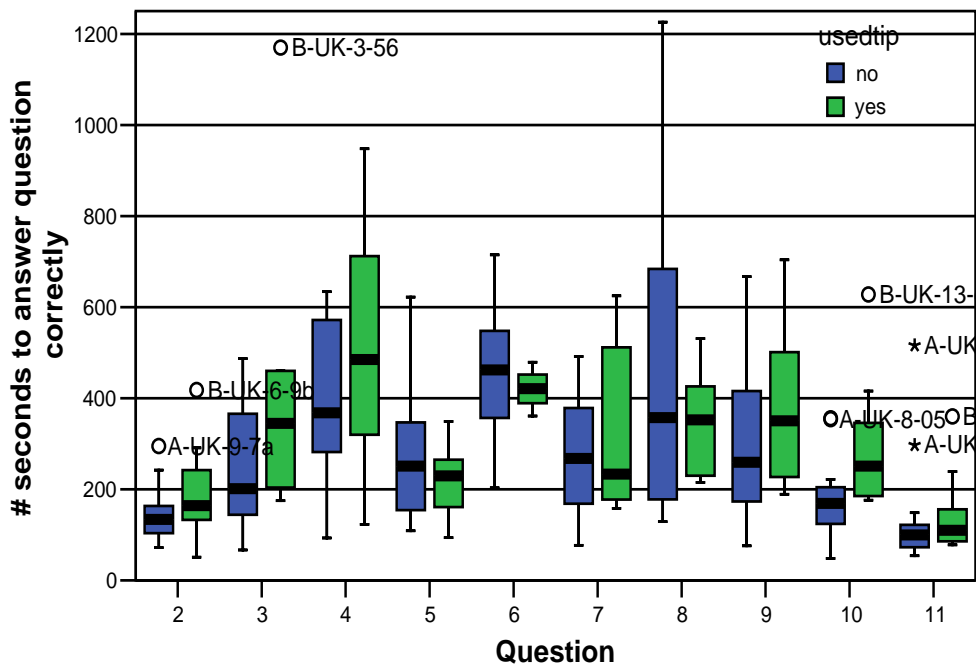
We were also interested in the ease with which questions were answered and differences across different types of question. We found strong variations across questions. With respect to time, in Experiment 2, on average subjects spent about 5 minutes (289s) on a question but the variation was

huge (std. dev. 198s) with some question being answered in less than 3 minutes (2, 11) while others (4, 6, 8) took almost 7 minutes. The following figure shows box plots to visualise the variation in time.

Figure 10. Variations in time taken to answer questions, Experiment 2

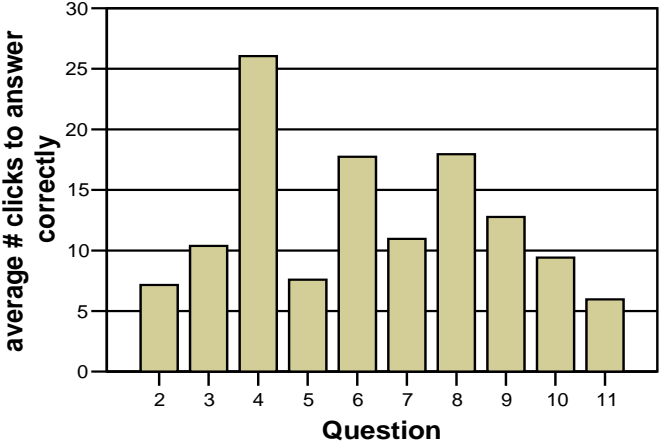


Note: This includes only correctly answered questions.



On average over the whole experiment, it took subjects 12 clicks (in contrast to 10 clicks in Experiment 1, where the questions were in general simpler) to answer a question but again there was huge variation ranging in average 6 to 26 clicks per question. Questions that took many clicks were 4 (choice of primary school), 6 (airline delay) and 8 (hospital performance), with clear implications for the time taken.

Figure 11. Path length used to answer questions, Experiment 2



Note: includes only correct questions.

The variation in difficulty of questions is illustrated particularly well by the two questions related to schools, as below.

4	Assume you have moved to Manchester, your postcode is M14 7FE. You are trying to find a primary school for your six year old daughter. Which SCHOOL in a one mile radius of your house achieves the best average results?	www.direct.gov.uk
5	Your daughter has not been admitted to the school you have chosen. You have contacted the school, but they say their decision is not reversible. They have told you that you might have the right to appeal against the decision. What do you have to do to appeal?	www.direct.gov.uk

Subjects found question 4 very difficult. To find a primary school that is both GOOD and CLOSE required to check for several parameters at once, a service that is offered neither by the BBC (which only provides ranking by results) nor by the government sites like Directgov or DFES (only providing distance and ranking respectively). Subsequently almost a third of the subjects either skipped the question or answered it wrong and most of those that did answer it spent a long time on it and visited many pages. While there is a balance between governmental sources (DFES, Directgov) and non-governmental sites (BBC), there is a lack of a site that combines the information that citizens are likely to be looking for. In contrast, question 5 was easily answered by most subjects, due in large part to comprehensive and easy to find information on Directgov, illustrating the government portal at its best: this question was the only question for which many people from Google found their way to the portal.

6. Rights-based questions can be very difficult to answer

We asked a number of questions that required subjects to look for information about their rights, such as the right to appeal or complain against a public or private decision for to free prescriptions or a minimum wage, shown below.

5	Your daughter has not been admitted to the school you have chosen. You have contacted the school, but they say their decision is not reversible. They have told you that you might have the right to appeal against the decision. What do you have to do to appeal?	www.direct.gov.uk
6	Your NAME OF AIRLINE flight from Barcelona to London was delayed by five and a half hours. Are you entitled to compensation and where can you claim it?	www.ec.europa.eu/transport/
9	Imagine you had an account with NAME OF BANK but they suddenly sent you a letter informing you that they are closing your account due to an internal review. You complain to the bank but they will still not give you any reason and say for them the matter is solved. Who could help you if you want to get the matter investigated?	www.direct.gov.uk
10	You have just been diagnosed with diabetes mellitus that will have to be treated with drugs. Do you have a right to free prescriptions?	www.nhs.uk
11	Imagine you are 25 years old and you just started a job. You're getting paid 5 Pounds per hour. A friend told you that businesses are required by law to pay at least a certain amount of money per hour. Do you have the right to get paid more than £5 per hour?	www.direct.gov.uk

This vital area shows both strength and weaknesses in government provided information. While citizens had little problems in locating the information for 5 (admissions appeal) and 11 (minimum wage), the other three questions 6, 9 and 10 posed serious problems. Question 5 and 11 were answered quickly with little time and clicks and predominantly with government sources. These two questions therefore serve as good examples of how government can provide vital information to its citizens in an easily accessible way. Conversely, the other three questions 6, 9 and 10 show the opposite with about a third of subjects being unable to answer these questions correctly and quite often had to skip completely (especially 9 and 10). The EU site in particular offered very little help for our subjects on airline delay compensation. What is more, it emerged that even those that used the site had trouble in finding the correct information for this question as it was obviously difficult to understand (both on the EU as well as the airline's site). There were also no alternative governmental sources that could substitute for the bad EU site.

In contrast, for question 9 and 10 there are a number of governmental sources in place. However, subjects that did not get the tip to use would often have to skip questions. This indicates that for question 9 and 10 there are in fact government sources (Directgov and NHS respectively) but they are not easily found with Google. Many people that did not use the tip had trouble finding complaints

information on the bank’s website and about a third did answer incorrectly or just skip the question. This is clearly an area where government sites should be more visible as naturally the bank might not be forthcoming on information on how to appeal against their decisions. But it is not only the low visibility on Google that caused problems: it is also hard to find the information once one is on the correct site as even half of those people that used our tip for 6 and 10 would eventually consult a search engine to find a suitable site. It has to be highlighted that the prescription information was especially hard to locate on the site as people spent a longer time answering when they did not use Google straight away.

In general private information providers had a particularly bad performance as far as letting people know their rights. This is highlighted by the fact that up to a third of subjects could not answer questions 6 and 9 correctly. For question 6 this was obviously due to the fact that people had trouble to correctly understand the provided information (as only one did skip, the rest thought they found the correct information but were wrong), while for question 9 it was simply hard to find (as 3 people skipped it). Our tip (the EU portal) was not helpful at all for subjects that used it (would often search instead for relevant information), while conversely it was helpful for question 9. While both highlights that as far as citizens’ rights are concerned the private sector is not helpful, it is especially bad to see that government also does not easily provide the relevant information. We have almost no government sources for question 6 and while we do have suitable government sources for question 9, only half of subjects did use them.

Summarizing, we see that while there is no lack of sufficient government information to inform citizens of their rights (with the exception of the EU airline compensation regulation), visibility (internal and external) needs to be increased for them (see 9 and 10). If that is achieved, this can yield very good results (see 5 and 11). Overall, however, it seems understandable that our subjects indicated that for issues concerning complaining, appealing and deliberation the Internet is not their first port of call as for all these questions here (except 11) subjects prefer the telephone or face to face contact.

7. UK Healthcare information is particularly difficult to find on-line

8	Your friend is going into hospital in NAME OF HOSPITAL in Oxford to have an operation. You would like to find out more about the hospital's record on quality of care. Can you find any information on the performance of the NAME OF HOSPITAL in Oxford?	www.nhs.uk
10	You have just been diagnosed with diabetes mellitus that will have to be treated with drugs. Do you have a right to free prescriptions?	www.nhs.uk

Quality health information seemed to be difficult to find online. Both the health related questions in Experiment 2 were often skipped and subsequently only a low 80 per cent of subjects found correct answers. The weaknesses of alternative providers of healthcare information is underlined by the fact

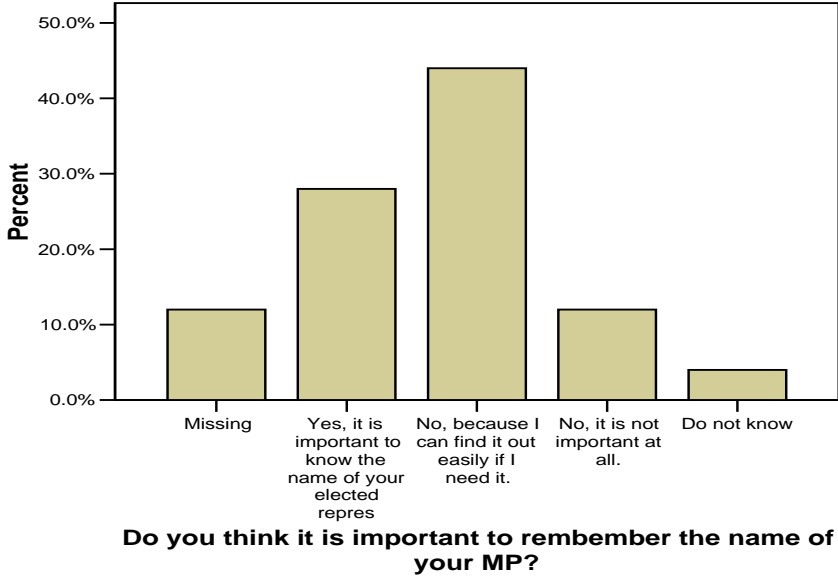
that subjects that did not use our tip (the NHS site) would often have to skip the questions while none of the subjects did that used our tip. However, that does not mean that government provided information was better or easier to find: It took our subjects many clicks and a lot of time to locate relevant information on question 8, hospital performance, mainly offered on gov sites (ie. NHS). For question 10 subjects that used the NHS tip would spend longer to find information on free prescriptions and, as noted above, would significantly more often answer incorrectly than the control group. What is more, the subjects that used the tip for question 10 had so much trouble (e.g. took a long time) locating the information on the NHS site that many would eventually use Google to find the information which led to half of these subjects finding the information on a non-governmental site. This was usually patient.co.uk that seems to have some visibility problems as some people did not find it with Google but that otherwise was the main source of information on free prescriptions for both treatments while government sources accounted only for 40% of sources on this relevant information. This finding is especially noteworthy in respect of recent publicity of citizen-initiated sites such as patientopinion.org.uk and government efforts to copy those efforts. Both have not yet made it significantly easier to find health related information online, especially related to performance information, in contrast to the success of citizen-initiated sites in the realm of politics, shown in the following section.

8. Social enterprise sites lead the way for information related to politics

2	You have just moved to Manchester, your postcode is M14 7FE. You don't know the name of your Member of Parliament (MP) representing you. Who is it?	www.parliament.uk
3	Can you find out how NAME OF MP, voted on the war in Iraq? Did she support the British military action?	www.parliament.uk
7	A friend of yours from the US has lived and worked in the UK for many years. He would like to apply for British citizenship. You have heard there is some kind of test he can take. Can you find out what he must do?	www.direct.gov.uk

In general the politics questions in Experiment 2 were an area in which subjects had little trouble to find the information: nobody had to skip a question and answers were mostly correct. What is more, subjects were quick (both in terms of clicks and time) to find the relevant information. In that respect the 40 per cent of our subjects who indicated that they do not need to know the name of their MP as they can find out easily if they need to in the post-experiment questionnaire are behaving rationally.

Figure 12. Proportion of subjects considering it important to remember the name of their elected representative, Experiment 2



The speed with which subjects located information on MPs and their voting behaviour appears to be associated with the strong performance of citizen-initiated sites. MySociety.org and the related projects WriteToThem, theyworkforyou.com and publicwhip.org.uk are important sources. This was especially true for information on voting behaviour for which the parliament website gave such inadequate information that even people that followed our advice had to turn to searching Google instead. However, the parliament site may be in part credited with this result as they have teaming up with upmystreet.com that provides the post code related information for people looking for the name of their MP. The information comes from upmystreet.com (although originally, presumably, came from parliament) but is branded for the parliament site and as of August it is now also hosted under the parliament.uk address (note that by the time of the experiment the content still came from the upmystree.com server which made it look like the information was not found through the parliament website when indeed it was). Our results are a good advertisement for such co-operation. For question 7, in contrast, information was conveniently provided by government sources. People that used the tip had no trouble finding the relevant link on Directgov and the other group had no trouble finding it with the help of Google so that both groups were reasonably quick.

9. Policy Implications

These results suggest that clearly and increasingly, citizens will turn to the internet to find government related information. Some questions that might have been previously difficult to answer are very easily answered using the internet. In particular, a regular internet user, it could be argued, has no need to remember the name of their MP, as they can easily find it should they need to know it. It

seemed that our respondents concurred, as when asked in a post-experiment questionnaire whether they thought it was important, only 29 per cent considered that it was 'important to know the name of your elected representative'. The prevalence of the Internet as a way of finding things out highlights the importance for government in ensuring that information they wish citizens to be able to locate is easily available on-line.

Once they get to the internet, most citizens use search engines to find what they want to know. In the UK at least, Google is overwhelmingly the search engine of choice. Indeed, in focus groups carried out for the NAO study (2007) noted above, many participants thought that the information they were finding was actually provided by Google. Furthermore, our subjects only rarely searched beyond the first 10 results, meaning that Google's search algorithm really is a gatekeeper to findability. They also exhibited a surprisingly wide variety of search strategies, suggesting that their search behaviour could be quite difficult for government organisations to predict and highlighting the need for detailed analysis of browser based usage statistics.

In the search engine world, government organisations face multiple competition for visibility. The evidence presented here seems to support the same authors' earlier hypothesis (see Escher et al, 2006) that governments could face a net loss of 'nodality' (Hood and Margetts, 2007) or visibility in the on-line world, given that such a high percentage of our questions were answered with non-governmental sources. If government wants information to be findable, then it must be visible. In previous work, we have used webmetrics such as 'inlinks' as a surrogate for visibility (see Escher et al, 2007; NAO, 2007).. But this experiment suggests that inlinks are not enough to ensure visibility. In particular, the UK government portal Directgov has a high number of inlinks (well over a million), but our subjects only rarely located information there for many questions.

With respect to government portals and web sites more generally, these findings show the dangers in assuming that citizens can be directed towards a government site. The current strategy of the UK government is to direct all citizens to Directgov and to close down the majority of existing governmental sites, leaving only 'corporate' sites with information about the department of agency. But this evidence suggests that this strategy does not chime well with internet users' behaviour on-line. The social enterprise sites such as mysociety.com did not perform well because citizens knew about them beforehand, or were directed there by other sites – they came across them when they were searching for the information they needed to enter these most basic of democratic questions.

The finding that people found health information especially difficult to locate from government is important, given that in the UK, looking for health information that has seen the sharpest rise. The percentage of respondents who said they had used the internet to look for information about health or medical care in 2007 was 68 per cent, up from 37 per cent in 2005 (Dutton and Helsper, 2007: 67).

The difficulty for citizens to find rights-based information on-line in some cases, and the failure of government health sites to provide information relating to healthcare, compared with the relative success of social enterprise sites in providing answers to questions relating to politics raises at least two important policy issues. First, social enterprise sites – when they work well – can be extremely beneficial to information seeking citizens. Government organisations should consider working with them, as with the seemingly successful co-operation between parliament.org.uk and the now commercial upmystreet.com. On the other hand, where such sites are less successful in attaining visibility (as with www.patientopinion.org) and government provision is inadequate, as seems to be the case with healthcare, citizens can find major gaps in the available information. Where information is reliant on volunteer efforts or social enterprises, government is reliant on them being successful. It is also reliant on the information they provide – often information originating from the government organisations themselves - being correct. Government organisations seeking to ensure that the information they want ‘digital citizens’ to have is labelled with some kind of assurance, in the same way that the company Intel label PCs over which they have no control ‘Intel inside’. They run the risk of their label being mis-used, but they may find – like Intel – that it is a risk worth taking².

10. Conclusion: the value of experiments.

We might expect that the movement of large chunks of social, political and commercial activity on-line would make it easier to study individual behaviour. But in fact, the concentration of usage data in commercial organisations, particularly search engines and even more specifically Google and their unwillingness to release such data or even to publish analyses of it can actually make it just as difficult to study on-line activity as it has traditionally been to research off-line activity. Experiments such as those reported here are one way to overcome this research challenge. Many commercial interactions have been extensively researched using experiments, in particular trust in commercial transactions (McKnight and Choudhury, 2002; Berendt and Guenther, 2005); pricing (Morgan and Orzen, 2006); auctions and reputations (Roth and Oxkenfels, 2002; Resnick and Zeckhauser, 2006; Katkar, Rama and Reiley, 2001) and the impact of different designs of e-commerce sites on customer experiences (Alpert and Karat, 2003; Menon and Kahn, 2002). Political scientists have used experiments to study collective action dilemmas (for example, Dawes et al, 1986; Frey and Iris, 1996; Orbell and Dawes, 1991) and how to overcome them (Ostrom et al, 1994, 2002). But in comparison with the huge amount of research dedicated by economists and political scientists to commercial sites, auctions in particular, there have been few experiments of this kind. The techniques used here might be extended to re-run the types of experiments run by Dawes et al (1986) to explore the impact on different types of information on social

² We are grateful to Chintan H Vaishnav from MIT for this insight.

choices and willingness to participate politically, in the same way that experimental economists have explored the impact of on-line charitable donation sites on users' generosity in charitable giving (Huck, 2007). We intend to embark on such a programme in the coming months.

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Annex 1: Experiment 1.

These experiments were undertaken for the NAO study *Government on the Internet* (NAO, 2007). We undertook user experiments with the aim of exploring where and how easily people find government-related information. We created a questionnaire with 15 questions (see below) that asks for information relating to common information needs of citizens and that is provided on UK government websites. We asked our participants to answer these questions with the help of the internet. They had one hour to complete all questions and could decide to skip a question if they felt they would not be able to find the answer or it was taking too long. Subjects were motivated via an initial payment for participating and a small additional payment for each correctly answered question. The experimental setup allowed us to check whether subjects answered a question correctly, where they found the information, how many (and which) pages they visited in order to find it and how long it took them to do so.

We used two treatments:

Treatment 1: Open Search – subjects were presented with a blank browser page and could use any means in order to locate the information necessary to answer the question.

Treatment 2: Cross-Government Website – subjects were asked to locate the relevant information by starting their navigation from the Directgov home page. They were allowed to use the internal search on the site or follow it to other sites, but they were not allowed to use external search engines.

We conducted four sessions over three days: two sessions in London (13 and 18 December 2006) and two sessions in Oxford (22 January 2007). We used two different samples: in London, the sample consisted exclusively of current students of University College London and in Oxford the sample consisted of internet users drawn from the general population of Oxford that were not studying. The number of participants for each treatment are as follows:

Participants for the Two Treatments

	Open search	Cross-government site	Total
General internet users	16	15	31
Student group	21	17	38
Total	37	32	69

Technical Setup and Acknowledgements

The subjects used PCs with the Firefox browser (version 1.5 and 2.0) with the Slogger extension³ in order to log times and the URLs of pages that were accessed through the browser. Subjects were presented with an online questionnaire that was created and subsequently analyzed via customized Perl scripts. In order to enable blocking of certain sites (e.g. access to search engines for people in the portal treatment), subjects accessed the internet through a proxy server, blocking was subsequently enforced via Apache's mod_proxy module. We are grateful to Tom Rutter and Brian Wallace from the UCL's ELSE laboratory for providing assistance for our London-based experiments. We are also grateful to the Fell fund that supported the setup of an experimental computer lab in Oxford, which we used to conduct our Oxford-based experiments (see <http://oxlab.oii.ox.ac.uk>).

³ <http://www.kenschutte.com/slogger/>

Questions for Experiment 1

No.	Text	options
1	You want to learn how to drive a car. You have been told that for this you need a provisional driving license. <i>In which ways can you apply for a provisional driving license?</i>	online only by post only online or by post
2	Some relatives of yours are living in the US and want to come over during Christmas. They also want to bring their dog to the UK. The dog has been micro-chipped and vaccinated against rabies but will that be enough to bring it over? <i>In order to bring a dog from the US to the UK, is it enough to have it micro-chipped as well as vaccinated against rabies?</i>	Yes No
3	Imagine you just got a new job and you're getting paid 6 Pounds per hour. A friend told you that businesses are required by law to pay at least a certain amount of money per hour to their employees. <i>Does the money you get paid satisfy legal requirements?</i>	Yes No
4	You are thinking about moving into a new area. You just got a nice offer for a place in Oxford. However, after a friend of you got burgled there you are wondering about the safety in Oxford. <i>Is the risk to become a victim of crime (any kind) greater in Oxford than in Britain in general?</i>	Yes No
5	You want to go on a winter holiday to France. The travel agent advised you to make sure you got a European Health Insurance Card. <i>How much do you have to pay for a European Health Insurance Card?</i>	10 Pounds 5 Pounds nothing at all
6	Imagine you have to choose a school for your daughter. A friend is suggesting the SCHOOL NAME in Oxford but you would like to make sure that it is a good school. <i>Does the SCHOOL NAME in Oxford achieve at least above average GCSE results for England?</i>	Yes No
7	A relative of yours has just been diagnosed with Diabetes Mellitus. For this condition he has to get treated with drugs that can get quite expensive. So far he always had to pay for his drugs but he wants you to find out whether he is now eligible for free prescriptions. <i>Are people that require drugs because of diabetes mellitus eligible for free prescriptions?</i>	Yes No
8	Imagine you are coming back from a holiday and you find that your car was broken into. Not much has been stolen but you need the crime number for insurance purposes. <i>Can you report the theft from you car online?</i>	Yes No
9	You want to earn an additional qualification to care for children. After getting some information you decide on a National Vocational Qualification (NVQ), level 3, in Children's Care that you would like to do part time while you are in Oxford. <i>What kind of NVQ level 3 course in Children's Care is available in Oxford?</i>	full-time part-time no course at all
10	An older relative of yours is interested in how much state pension he will receive once he is 65. <i>Can you find a site where he could get information on the amount of state pension he can expect?</i>	Yes No
11	During the Christmas break you are staying with a friend of yours in Oxford. Recently you read an article about the computer operating system Linux which did recommend Ellen Siever's book "Linux in a nutshell". <i>In which local library in Oxford could you find this book?</i>	Abingdon Library Central Library Headington Library Summertown Library Woodstock Library

12	<p>You want to go on a holiday but after hours of searching at home you still cannot find your passport. You finally decide you will have to apply for a replacement. <i>How can you apply for a replacement passport?</i></p>	<p>fill in a form online and that is it fill in a form online but still have to sign a paper copy not possible to do it online at all</p>
13	<p>You are planning to move to Manchester and are looking to find a job there (as a shop assistant in a supermarket) before you go. <i>Can you find a list of shop assistant positions available in Manchester?</i></p>	<p>Yes No</p>
14	<p>You have a tax code 488L on your payslip but you don't really understand what it means. <i>Can you find out what the 488 in the tax code stands for?</i></p>	<p>it does not mean anything it identifies your tax office you have 4880 Pounds tax free pay the last digits of your National Insurance number</p>
15	<p>You are thinking of buying a house in Wolvercote in Oxfordshire but you are worried about possible flooding. <i>How severely is Wolvercote (Oxfordshire) affected by flooding?</i></p>	<p>not at all only a bit very much</p>

Experiment 2

Date: 14th June 2007: 5pm – 7pm

15th June 2007: 11am – 1pm

Location: OXLab, Said Business School Training Room B

Sample: 29 participants in total

- 13 general Internet users (because 4 were excluded)

- 12 students

Setup: 10 + 1 questions to be answered with freely available Internet

to be answered by short note and URL of information source

two treatments:

A: question only

B: question displayed alongside suggestion of a useful site

		Treatment		
		A: open treatment	B: advice	Total
student	non-students	7	6	13
	Students	6	6	12
	Total	13	12	25

£5 show up fee

£1 per correctly answered question

Duration: ~ 90mins in total

- 60mins for questions,

- 20mins pre- and post questionnaire

- payout

The technical set – up was the same as for Experiment 1.

Questions for Experiment 2

#	Question	Answer	Tip	Explanation
1	You have a tax code 488L on your payslip, but you are not sure what that means. Can you find an explanation of your tax code?	you have 4880 Pounds of tax free pay	www.direct.gov.uk	main cross-government web site for UK government
2	You have just moved to Manchester, your postcode is M14 7FE. You don't know the name of your Member of Parliament (MP) representing you. Who is it?	Gerald Kaufman MP	www.parliament.uk	web site of the UK parliament
3	Can you find out how NAME OF MP, voted on the war in Iraq? Did she support the British military action?	No, strongly against	www.parliament.uk	web site of the UK parliament
4	Assume you have moved to Manchester, your postcode is M14 7FE. You are trying to find a primary school for your six year old daughter. Which SCHOOL in a one mile radius of your house achieves the best average results?		www.direct.gov.uk	main cross-government web site for UK government
5	Your daughter has not been admitted to the school you have chosen. You have contacted the school, but they say their decision is not reversible. They have told you that you might have the right to appeal against the decision. What do you have to do to appeal?	yes	www.direct.gov.uk	main cross-government web site for UK government
6	Your NAME OF AIRLINE flight from Barcelona to London was delayed by five and a half hours. Are you entitled to compensation and where can you claim it?	entitled to refund of fare, free meals and hotel (if overnight)	ec.europa.eu/transport/	European Commission's Transport website
7	A friend of yours from the US has lived and worked in the UK for many years. He would like to apply for British citizenship. You have heard there is some kind of test he can take. Can you find out what he must do?	take a citizenship test	www.direct.gov.uk	main cross-government web site for UK government
8	Your friend is going into hospital in NAME OF HOSPITAL in Oxford to have an operation. You would like to find out more about the hospital's record on quality of care. Can you find any information on the performance of the NAME OF HOSPITAL in Oxford?	intermediate, quality of service: good, use of resources: weak	www.nhs.uk	UK National Health Service
9	Imagine you had an account with NAME OF BANK but they suddenly sent you a letter informing you that they are closing your account due to an internal review. You complain to the bank but they will still not give you any reason and say for them the matter is solved. Who could help you if you want to get the matter investigated?	Financial Ombudsman Service	www.direct.gov.uk	main cross-government web site for UK government
10	You have just been diagnosed with diabetes mellitus that will have to be treated with drugs. Do you have a right to free prescriptions?	yes	www.nhs.uk	UK National Health Service
11	Imagine you are 25 years old and you just started a job. You're getting paid 5 Pounds per hour. A friend told you that businesses are required by law to pay at least a certain amount of money per hour. Do you have the right to get paid more than £5 per hour?	yes, 5.35 for over 22year olds	www.direct.gov.uk	main cross-government web site for UK government