

Department for Culture, Media & Sport

Research into consumer understanding and management of internet cookies and the potential impact of the EU Electronic Communications Framework

*Summary and
Conclusions*

March 2011

This document is an extract of a longer report, which will be published in April 2011 and will accompany the Government response and the Impact Assessments on the implementation of the revised EU Electronic Communications Framework.

In December 2010, The Prime Minister decided that competition issues relating to the media, broadcasting, digital and telecoms sectors would transfer from the Department for Business, Innovation and Skills (BIS) to the Department for Culture, Media and Sport (DCMS) to whom this report will now be issued. The machinery of government change has since taken place and responsibility has been transferred for these areas, which includes telecommunications policy and the implementation of the EU framework.

Summary and conclusions

Summary and conclusions

Requirements set by DCMS

PricewaterhouseCoopers LLP (PwC) was commissioned Department for Culture, Media and Sport (DCMS)¹ to undertake research into the potential impact of further regulation of internet cookies as a result of revisions to the EU Electronic Communications Framework (ECF). Internet cookies are small text files that can be saved on an internet user's computer when visiting a website; effectively, they act as a memory of what has happened previously when the computer has interacted with that website.

The two key objectives of our research were:

- to analyse the response of internet users to the proposed changes envisaged as a result of implementing the ECF; and
- to analyse, and where possible quantify, the potential impacts of the changes on business.

The results of our research are intended to inform the Department of Culture, Media and Sport (DCMS) Impact Assessment of the options for implementing changes to the ECF.

Background to the research

Article 2 of Directive 2009/136/EC (the Directive) amends the E-Privacy Directive 2002/58/EC (the E-Privacy Directive) setting out the fundamental rights and freedoms of EU citizens when using electronic communications. Of particular note for our work is the change to Article 5(3) of the E-Privacy Directive: in future, internet users will be expected to give consent when information is stored or accessed on their terminal equipment whenever this is not strictly necessary for a service explicitly requested by the user. The previous requirement was to offer users "the right to refuse".

This amendment affects the use of internet cookies. Internet cookies can expire after a web session or persist and last beyond the current web session. They can also be separately categorised as either first party internet cookies, which originate from the domain being visited by the user, or third party internet cookies, which originate from a domain other than the one visited by the user.

EU Member States are required to adopt and publish the laws, regulations and administrative provisions necessary to comply with the Directive by 25th May 2011.

In September 2010, Government published a consultation paper which set out its proposed approach to implementing the provisions of the revised ECF. The paper, which was accompanied by an interim Impact Assessment, considered two options for implementing the provisions of the amended Directive as they relate to internet cookies:

- A full 'Opt-in' system whereby internet users would have to accept each internet cookie placed on their computer. This would require repeated pop-up windows or other virtual labels on every web page visited by a user where internet cookies are in use. Each pop-up would need to give details about the individual internet cookies in order to help internet users make informed decisions.
- 'Enhanced browser settings' which would provide internet users with enough information and the capability to make an informed decision when deciding which internet cookies their browser should accept. It would mean that browser settings would need to be more visible to internet users who would need to be provided with clear and comprehensive information about internet cookies and how to opt-out of them if they wish. It might also require browser vendors to change the actual options presented

¹ In December 2010, The Prime Minister decided that competition issues relating to the media, broadcasting, digital and telecoms sectors would transfer from the Department for Business, Innovation and Skills (BIS) to the Department for Culture, Media and Sport (DCMS) to whom this report will now be issued. The machinery of government change has since taken place and responsibility has been transferred for these areas, which includes telecommunications policy and the implementation of the EU framework.

(including how distinctions are made between different types of internet cookie or their use) and/or the default option.

The consultation paper indicated that Government's preferred option was 'Enhanced browser settings' because "it allows the UK to be compliant with the E-Privacy Directive without the permanent disruption caused by an 'Opt-in' regime"². Subsequently, during the course of our work, a third option has emerged which would involve internet users being provided with increased levels of information and notice regarding individual internet cookies. For example, it might entail the use of a device similar to the 'eye icon' which is currently being tested in the behavioural advertising sector. The icon, which is presented by adverts on online publishers' websites, informs users of the presence of behavioural tracking internet cookies and enables them to access more detailed information on the internet cookies as well as giving them the option to opt-out of each advertising intermediary's internet cookie. Such an 'Enhanced information' option might be implemented as part of a self-regulatory initiative, for example by online publishers, advertisers, online retailers or other cookie users.

Framework used in research

At the outset, we developed an impact framework. This set out the evidence we required to assess the potential costs and benefits of the proposed (or possible) legislative options, both for users of the internet and for those businesses which supply products and services over the internet and which make use of internet cookies. To populate this framework, we undertook consumer research and business case studies. Below, we summarise the results and our assessment of the likely impacts of the three options.

Figure 1 - Potential impact framework



Source: PwC

Consumer research

We conducted an online survey of 1,012 individuals in February 2011. The sample was drawn randomly from Research Now's online panel, drawn from across the UK and all age and socio-economic groups. As might be anticipated, respondents were relatively intensive internet users.

Our survey showed that:

- More than three quarters of the survey respondents (77%) said they were concerned about internet security.
- About one third of respondents (32%) indicated that they had actively changed their privacy settings on their internet browser to give more privacy but 28% did not check the privacy settings at all and another 20% of respondents reviewed their browser settings but did not change them. Only 1% changed their default settings to give them less privacy.
- Respondents who expressed concerns about internet security were most often concerned about catching a virus or other computer infection (88%), incurring a financial loss due to fraudulent payment (82%) or the abuse of personal information sent over the internet (75%).
- The large majority of respondents (85%) were not aware of any of the existing internet cookie 'opt-out' solutions. Only 6% of respondents indicated that they are aware of TACO for Firefox and 9% that they are aware of anonymous browsing. 29% of those respondents who are aware of the 'opt-out' possibilities had not used them.

² <http://www.bis.gov.uk/assets/biscore/business-sectors/docs/i/10-1133-implementing-revised-electronic-communications-framework-impact.pdf>, page 146.

- Most respondents (83%) indicated that they are not aware of forthcoming changes to the way in which use of internet cookies will be regulated.
- Respondents recognised that they had limited knowledge and understanding of internet cookies: only 13% of respondents indicated that they fully understand how internet cookies work and 45% indicated that they had some understanding of them. In contrast, 37% had heard of internet cookies but did not understand how they work and 2% of people had not heard of internet cookies before participating in the survey.
- Testing of respondents' knowledge of internet cookies confirmed their limited understanding: Only for one out of sixteen internet cookies related statements a majority of respondents knew the correct answer with other respondents either selecting the incorrect answer or indicating that they did not know the answer.
- Just fewer than one in five respondents (18%) stated that they accept all internet cookies whilst 36% accept only selected internet cookies and 9% do not accept any internet cookies. Over one third (37%) do not know how they manage internet cookies on their computer.
- Survey respondents who indicated that they only accept selective internet cookies were asked what types of internet cookies they currently accept. The results indicate that they are more likely to accept an individual internet cookie when the site is frequently visited, rejection of the cookie will incur a loss of functionality or the company has a good reputation. Only 17% of respondents indicated that they read the privacy statement of a website.
- Nearly two thirds of respondents (62%) think that it is very important to know the purpose of an internet cookie and 56% think it is very important to know how to delete internet cookies. Roughly 40% of respondents indicate that the contents, issuer and impact on functionality are very important pieces of information when deciding how to manage internet cookies.
- When asked what time they would spend deciding whether or not to accept an internet cookie, almost a quarter of respondents (23%) indicated that they would decide instantly whether to accept the internet cookie. The majority of respondents (59%) said that they would need some time to read the information presented and would then decide whether to accept an internet cookie and 18% said that they would need some time to read the provided information and do additional research and / or ask for help.

Respondents were asked about the impact of the three regulatory options on their decision whether or not to accept internet cookies:

- They generally indicated that 'Opt-in' would lead to the largest change in behaviour followed by the 'Enhanced information' approach and the 'Enhanced browser settings' option.
- Roughly one third of respondents indicated that they were unsure how their behaviour with regard to internet cookies would change.
- Overall, most respondents preferred the 'Opt-in' option followed by the 'Enhanced information' approach and, finally, the 'Enhanced browser settings' option. A large number of respondents indicated that they have only limited a priori knowledge of internet cookies.
- Finally, survey respondents were asked about their willingness to pay if their Internet Service Provider could manage the internet cookies delivered to their computer precisely according to their preferences. On average respondents reported that they were willing to pay an amount equivalent to about 5-6% of their total payments for internet services (£0.67-£0.78 per month depending on calculation) for management of internet cookies but 57% of respondents stated that they would be unwilling to pay anything for this service. On this basis, the overall willingness to pay for the UK adult online population is estimated to be about £300 -£380 million per annum. This estimate however, should be considered as indicative as survey participants were relatively heavy internet users and the figure is based upon stated as opposed to revealed willingness to pay.

Business case studies

In addition to the online survey of internet users, we also conducted a series of 20 case studies with businesses. The choice of case studies was developed in conjunction with DCMS which had previously identified those sectors that are most likely to be impacted by implementation of the proposed changes to the E-Privacy Directive. We also used available data on the pattern of internet use by business to inform our choice of

sectors.³ The sectors identified have been broadly categorised as: hardware vendors; internet browser vendors and other software vendors; the advertising industry (including various kinds of intermediaries between advertisers and online publishers); online retailers; and online publishers (including B2B and B2C in both the private and public sectors).

No interviewed company was able to provide quantitative estimates of the direct costs they would expect to incur in complying with each of the regulatory options. We understand this was due to the following reasons:

- There is ambiguity associated with the wording of the Directive: this has a bearing on the likely costs of compliance because it affects the extent to which firms may need to change their business strategy and operations.
- Few (if any) companies were fully prepared with plans on how to implement potential changes.
- There is no 'leading response': no one firm or sector has stepped forward to lead or coordinate a response and there is a lack of clarity as to where the responsibility lies.
- Costs depend significantly on browser vendors' behaviour and whether they act uniformly. For example, costs for cookie users are likely to increase if browser vendors do not act uniformly.
- The change in user behaviour associated with some of the options is expected to have a significant bearing on some industries and companies (but is itself difficult to predict).

Although no quantification was possible, our discussions showed that business expects four factors to drive costs:

- The precise legislative requirements (the most important factor).
- Whether, and if so, how, browser vendors respond.
- The number of companies which need to implement the changes (which depends on how browser vendors respond).
- The extent to which there are displacement effects and efficiency losses.

Finally, the results of the business case studies fed directly into our (sector specific) assessment of overall impacts (alongside the results of the consumer survey). Some general overarching insights from the business case studies were:

- The 'Enhanced browser settings' option was seen as the least disruptive for the general management of internet cookies. Generally, the view was that this method would be preferable in terms of maintaining the online user experience. The selection of default options is seen as critical as a determinant of consumer behaviour.
- Browser vendors are commonly seen as the potential 'first mover' in providing the technical framework for the communication of information and settings with websites. Standardisation in browser settings and format across browsers is seen as desirable to minimise the costs for other businesses.
- It would be desirable to provide consistent presentation of information to end users.
- Enhanced information / 'eye icon' for third party behavioural advertising is seen as a special case and greater regulation and information were generally seen as justified.
- The speed of response required for implementation (late May 2011) is extremely challenging for business: interviewees cited the extended planning/implementation period required (typically over six months).

Conclusions

Finally, we draw together the evidence we have from both the business case studies and the consumer survey to compare the expected benefits and costs of the three regulatory options. For the reasons explained above, much of our analysis is necessarily based on qualitative evidence, rather than quantified estimates of the costs.

It is important to consider the potential benefits of the amended E-Privacy Directive for consumers: over three quarters of the respondents in our online survey stated that they are concerned about internet security. Furthermore, 42% respondents stated that there are activities they do not undertake because of internet security concerns. The amended E-Privacy Directive is likely to increase consumer control, trust and

³ E-commerce and ICT activity 2009, Statistical Bulletin, ONS.

confidence. All of these are benefits are likely to transpose into economic benefits (which are however, difficult to measure).

‘Opt-in’

Compared to the other options, the ‘Opt-in’ option is likely to impose the largest total costs on the UK economy for the following key reasons:

- The ‘Opt-in’ option is likely to give rise to direct costs for all cookie users and especially the large number of online publishers.
- Internet users will potentially incur large time costs managing their use of internet cookies. If each user had to manage (only) 200 internet cookies per annum, then the consumer survey suggests that the total cost of would be around £170- £190 million per annum. Furthermore, their online experience could also be significantly disrupted. However, the results of the online survey in which ‘Opt-in’ was ranked first by most consumers contrast these calculations and seems to document a wish for more control with regard to internet cookies. It is, however, unclear whether the above time costs have been fully considered by survey participants.
- The ‘Opt-in’ option is likely to lead to the largest displacement effects as business shifts from online channels to offline channels. Although offline business will benefit from these effects, there will be associated efficiency losses (unrealised sales, additional consumer and business costs) which represent economic costs.

The costs are likely to be non-uniformly distributed across the business community. Businesses with websites which rely most heavily on the use of internet cookies will be most affected. Furthermore, internet cookies are most likely to be accepted if they come from large, well known companies and public sector institutions which are most trusted by consumers.

The ‘Opt-in’ option is likely to increase the overall level of trust of internet users and this might increase the volume of certain online transactions.

The following table summarises the main effects by industry.

Table 1 - ‘Opt-in’ effects by industry

Group	Main effects
Browser vendors	<ul style="list-style-type: none"> • Costs incurred in creating information standards for internet cookies. • Costly reengineering of browser functions might be necessary. • Different technical implementation by vendors increases costs of cookie users.
Online publishers	<ul style="list-style-type: none"> • Information on cookies is readily available, but a large number of companies and bodies in the public sector would need to provide and submit information which would increase total costs. • Reengineering of website functionalities and management of session cookies would increase costs. • Displacement effects would lead to redistribution: traditional publishers (offline) would be likely to benefit whereas internet publishers would be likely to lose business as consumers switch to ‘offline’ media. Costs are incurred as a result of efficiency losses.
Specific industries	
Online Advertising	<ul style="list-style-type: none"> • Large reduction of behavioural advertising volume and potentially online advertising volume due to ‘opt-out’. • Displacement effects: traditional forms of advertising would be likely to benefit whereas online advertising would be likely to lose business. Economic costs because of efficiency losses.
Web analytics	<ul style="list-style-type: none"> • Large reduction in web analytics volume and therefore business due to ‘opt-out’.

Group	Main effects
	<ul style="list-style-type: none"> Displacement and efficiency losses (see online advertising).
Online retailing	<ul style="list-style-type: none"> Basic web basket functionality of online retailers is likely to stay functional because of 'strictly necessary' provision. Reengineering of other website functionalities and management of session cookies would increase costs. Reduction in user online experience and therefore traffic and sales. Displacement effects: 'high-street shopping' would benefit whereas online retailers would be likely to lose business. Costs are incurred as a result of efficiency losses.
Hardware	<ul style="list-style-type: none"> Potentially costly reengineering of warranty and update processes. Obtaining consent for preloaded cookies might be necessary.

Source: PwC analysis

'Enhanced information'

The 'Enhanced information' option would be likely to lead to relatively small overall economic costs.

- The option is industry specific (targeted towards behavioural advertising and web analytics) and only a limited number of companies would incur direct costs. It seems not feasible to use this option as an overarching approach as is the case for the other two regulatory options.
- Initial trials show that the approach would not lead to large scale consumer reactions.

A general benefit of the 'Enhanced information' approach would be the presentation of information in context, i.e. the user would be able to request additional information on internet cookies when they were in use. This would be likely to have positive implications for users in terms of enhanced trust.

The 'Enhanced information' option does not seem feasible in a wider context for publishers due the large number of companies and associated coordination problems and the diverse use of cookies. Nevertheless, it potentially can be applied in a 'mixed implementation' strategy for behavioural advertising (and web analytics).

Industry specific impacts are summarised in Table 2 below.

Table 2: 'Enhanced information' effects by industry

Group	Main effects
Browser vendors	<ul style="list-style-type: none"> No immediate impact.
Online publishers	<ul style="list-style-type: none"> No immediate impact as it is unlikely to be feasible for large and diversified group of online publishers.
Specific industries	
Online Advertising	<ul style="list-style-type: none"> Direct costs incurred for creation of platform and management of cookies. Small displacement effects shifting business from behavioural advertising to other forms of online and offline advertising. Small efficiency losses.
Web analytics	<ul style="list-style-type: none"> If included in approach see online advertising effects.
Online retailing	<ul style="list-style-type: none"> No immediate impact as a cross-industry initiative would be unlikely to be feasible.
Hardware	<ul style="list-style-type: none"> No immediate impact as a cross-industry initiative would be unlikely to be feasible.

‘Enhanced browser settings’

The cost incurred by the ‘Enhanced browser settings’ option would depend significantly on the precise implementation and requirements of the option. For example, if browsers were already deemed to be compatible with the amended E-Privacy Directive then no costs would be incurred by the implementation of this option. However, if browser vendors were required to reengineer their browsers, this would entail direct costs for vendors and potentially associated technology costs for cookie users who must coordinate with the underlying browser technology framework(s). The costs could become substantial. We estimate the economic costs of this option to be in general lower than the costs incurred by ‘Opt-in’ for the following reasons:

- ‘Enhanced browser settings’ would concentrate the requirements for regulatory compliance onto a small number of stakeholders; direct costs could be limited to browser vendors.
- The option would generally lead to one-off consumer costs as opposed to recurring costs of ‘Opt-in’.

The consumer response to this option would be dependent on the information provided and the default options (as shown in consumer research) and could have a significant impact on economic costs as business adapted to this response.

Currently internet browsers make a distinction between first party and third party cookies. If browser vendors’ interpretation of ‘Enhanced browser settings’ involved blocking third party cookies by default, this would entail large costs on the advertising and web analytics industries. In addition, costs would be incurred by the advertising industry if users were provided the option to block behavioural tracking cookies⁴ in browser settings, perhaps even by default. Online retailers and hardware vendors rely less critically on these kinds of cookies and are therefore less exposed to changes in browser settings.⁵

Generally, ‘Enhanced browser settings’ could potentially provide a solution for most internet cookies in use. The option could be refined by ‘Enhanced information’ or ‘Opt-in’ options for specific internet cookies uses and / or industries.

Industry specific impacts are qualitatively summarised in Table 3 below.

Table 3: ‘Enhanced browser settings effects by industry

Group	Main effects
Browser vendors	<ul style="list-style-type: none">• Costs would depend on precise requirements: whether browsers are already compliant / it would be necessary to provide additional information / it would be necessary to reengineer browsers?
Online publishers	<ul style="list-style-type: none">• No immediate impact.
Specific industries	
Online Advertising	<ul style="list-style-type: none">• Impact dependent on interaction with ‘Enhanced information’ approach and specified default settings.• If advertisers’ third party or behavioural cookies are blocked effects similar to ‘Opt-in’.
Web analytics	<ul style="list-style-type: none">• See online advertising.
Online retailing	<ul style="list-style-type: none">• No immediate impact.
Hardware	<ul style="list-style-type: none">• No immediate impact.

⁴ Behavioural tracking cookies are cookies that track a user’s behaviour across a number of sites such as to display advertisements that are most likely to lead to a sale.

⁵ It is unlikely that ‘Enhanced browser settings’ would require all cookies to be blocked by default.

Overarching Conclusion

Having looked at the three options, the implementation of a mixed approach is likely to be sensible. Whereas 'Enhanced browser settings' could be a sensible and time-saving approach for day-to-day management of cookies, consumers' wish for more control could potentially be accounted for by 'Enhanced information' or 'Opt-in' in specific circumstances.

The section above is an extract of a report prepared by PricewaterhouseCoopers LLP (PwC) solely on the instructions of its clients, the Department for Business, Innovation & Skills (BIS) and Department for Culture, Media and Sport (DCMS) and with only BIS and DCMS's interests in mind. It should not be quoted in whole or part without the prior consent of PwC. To the extent permitted by law, PwC, its members, partners, employees and agents specifically disclaim any duty or responsibility to any third party which may view or otherwise access the Report, whether in contract or in tort (including without limitation, negligence and breach of statutory duty) or howsoever otherwise arising, and shall not be liable in respect of any loss, damage or expense of whatsoever nature which is caused by or as a consequence of such viewing of or access to the Report by any such third party. Third parties are advised that this Report does not constitute professional advice or a substitute for professional advice, should not be relied on in relation to any business or other decisions or otherwise and is not intended to replace the expertise and judgement of such third parties independent professional advisers.

In the event that, pursuant to a request which BIS or DCMS has received under the Freedom of Information Act 2000 or the Environmental Information Regulations 2004 (as the same may be amended or re-enacted from time to time) or any subordinate legislation made there under (collectively, the "Legislation"), BIS or DCMS is required to disclose any information contained in this report, it will notify PwC promptly and will consult with PwC prior to disclosing such information. BIS and/or DCMS agree to pay due regard to any representations which PwC may make in connection with such disclosure and to apply any relevant exemptions which may exist under the Legislation to such information. If, following consultation with PwC, BIS or DCMS disclose any such information, it shall ensure that any disclaimer which PwC has included or may subsequently wish to include in the information is reproduced in full in any copies disclosed.

© 2011 PricewaterhouseCoopers LLP. All rights reserved. "PricewaterhouseCoopers" refers to the PricewaterhouseCoopers LLP (a limited liability partnership in the United Kingdom) or, as the context requires, other member firms of PricewaterhouseCoopers International Limited, each of which is a separate and independent legal entity.