

Submission to the House of Commons Select Committee on Science and Technology Inquiry into "Scientific advice, risk and evidence: how government handles them" with particular reference to the technologies supporting the Government's proposals for identity cards

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Executive Summary

1. This submission presents the experience of the LSE Identity Project team on the government's use of scientific and technological advice on the Identity Cards scheme. The team has identified areas of concern with the way that the government uses this advice in almost all aspects of the project; indeed we would suggest that this project would be an ideal candidate for how *not* to use scientific and technological advice for building a large scale, complex project¹.
2. The biometric technology at the core of the scheme has been untested at the scale proposed by the Home Office, the database with the details of every ID card holder is likely to become a significant target for security attacks, and the practicalities of implementing the ID cards scheme across government and the private sector have all been questioned by scientific and technological experts. Very little of this expert advice appears to have had any impact on the shape of the ID cards scheme and it would seem that the Home Office is intent on short-cutting any discussion of this expert advice in favour of its own particular conclusions: the technology will work and achieve its aims.

The LSE Identity Project

3. Many departments at the LSE have played prominent roles in academic and policy circles on issues relating to information policy. The LSE Identity Project is another such initiative to generate understanding and inform policy debate and deliberation. For decades the London School of Economics has been conducting research on a wide variety of pressing policy issues. LSE staff advise governments, serve on Royal Commissions, public bodies and government inquiries, and are seconded to national and international organisations. In the past three years alone, the LSE has conducted research and analysed policies in over 70 different projects commissioned and funded by a variety of UK Government departments and agencies amounting to more than £11m.

¹This view is shared by the IEEE Spectrum magazine, which named the ID cards scheme one of the worst technology projects in 2006. "Why It's a Loser: The design of the system is based on unreliable and inadequate technologies that could result in privacy and security problems". See <http://www.spectrum.ieee.org/jan06/2597>

4. The Department of Information Systems began its research into authentication and identification systems in the 1990s. In 2003 it decided to conduct research to inform policy deliberation on biometric identification systems. Subsequently, the Department began a concerted initiative to inform the debate on the proposed identity card, first by hosting a number of public meetings on the then “entitlement card”, then convening meetings with industry leaders and government departments. In 2005 this research activity culminated in the LSE’s ‘Identity Project’.
5. Over a hundred researchers and experts in technology and policy contributed to the project’s two reports over a concentrated period of months. The results were a three hundred page *main report* issued in June 2005 and a follow-up fifty five page research *status report* issued in January 2006². The reports questioned some of the key policy goals of the ID cards scheme, reviewed the likely effects on policing, assessed the challenges and risks in the Government’s proposals, and offered an alternative scheme for public consideration.
6. As well as contributing directly to the policy process through criticism, advocacy and deliberation, members of the Identity Project have an ongoing academic interest in the policy development process, especially as it relates to technological issues and technological expertise. Our submission therefore aims to assist the Committee in its work on these important issues and we particularly draw to the attention of the Committee to two sections of our *status report*: The research challenges that we identify in section II and the unanswered questions presented in section III.
7. In presenting our points, we draw on detailed evidence presented in our two reports as well as wider evidence, but do so not to replay issues that have been scrutinised in parliamentary debate but rather to raise those methodological concerns we have noted during this study.
8. The remainder of this submissions is structured as follows. We next outline the research philosophy that underlies our work, before addressing the five areas of concern specified in the committee’s terms of reference. For each of these areas, we highlight particular examples of problems that we discovered during our analysis of the government’s Identity Cards scheme.

²Electronic copies of these reports, plus associated press releases and links to press coverage are available at <http://is2.lse.ac.uk/IDcard/default.htm>

Research philosophy

9. A number of members of the Identity Project have particular research interests in understanding the relationship between technology and society and their relationship to policy deliberation³. Others have research interests in the management and implementation of large IT projects, including government IT projects⁴.

10. In our research we have drawn heavily on theories that emphasize the role that social factors play in the shaping of technological artefacts as well as the work of Bruno Latour on the nature of scientific facts. His recent book on the politics of nature⁵ has been particularly influential. In this work (which is focussed on scientific results about 'nature' but presents an argument that can equally be applied to 'technology') Latour raises concerns about 'due process' in incorporating scientific results for public policy issues, especially when the scientific results are currently uncertain. Recent examples of such uncertainty in science include global warming and BSE. In a similar manner, we would argue

³For example, Hosein I (2004) The Sources of Laws: Policy Dynamics in a Digital and Terrorized World. *The information society* **20(3)**, 187-199.; Hosein I and Whitley E A (2002) The regulation of electronic commerce: learning from the UK's RIP act. *Journal of Strategic Information Systems* **11(1)**, 31-58; Whitley E A and Hosein I (2005) Policy discourse and data retention: The technology politics of surveillance in the United Kingdom. *Telecommunications Policy* **29(11)**, 857-874.

⁴For example, Angell I O and Demetis D (2005) Systems thinking about anti-money laundering: considering the Greek case. *Journal of money laundering control* **8(3)**, 271-284.; Dunleavy P, Margetts H, Bastow S, Bouček F and Campbell R (2003) *Difficult forms: How Government agencies interact with citizens.*(NAO), Report HC 1145 Archived at http://www.nao.org.uk/publications/nao_reports/02-03/02031145.pdf; Margetts H and Dunleavy P (2002) Better public services through e-government.; Sauer C and Willcocks L (2001) *Building The E-Business Infrastructure*. Business Intelligence, London.; Willcocks L and Griffiths C (1997) Management and risk in major IT projects. In *Managing IT As A Strategic Resource* (Willcocks L, Feeny D and Islei G eds.) McGraw-Hill, Maidenhead.; Willcocks L, Petherbridge P and Olson N (2003) *Making IT count: Strategy, delivery, infrastructure*. Butterworth, Oxford.; Willcocks L P and Kern T (1998) IT outsourcing as strategic partnering: the case of the UK Inland Revenue. *European Journal of Information Systems* **7(1)**, 29-45.

⁵Latour B (2004) *The politics of nature: How to bring the sciences into democracy.* (trans Porter C) Harvard University Press, Cambridge, MA.

that there is also considerable uncertainty surrounding most aspects of the ID cards scheme.

11. Latour starts from the distinction between 'facts' and 'values' and notes that, in both cases, they are made up of two distinct activities. What we commonly understand to be scientific or technological 'facts' are actually the result of a process whereby we start with 'perplexities' ("Do greenhouse gases contribute to global warming?") and end up with institutionalised agreements of accepted truths ("Gravity exists and has these properties"). A similar two part process applies to values, which he suggests can be understood in terms of activities of consultation and hierarchy.
12. From these distinctions, Latour argues that we need to be careful to ensure that due process is followed in moving from perplexities to institutionalised truths. In particular, he is concerned about short-cuts being taken whereby perplexities become institutionalised truths without undergoing due process. For example, moving from perplexities about the scalability of biometrics systems to the truth that the technology exists and is suitable for use in the ID cards scheme. He proposes a model by which due consideration is given to perplexities through processes of consultation and hierarchy, some of which are incorporated into responses (institutionalisation) at a particular time, before repeating the process with new perplexities and considerations in the next time frame. See⁶ for an application of this model to policy debate around technological issues.
13. More generally, we recognise the difficulties that any policy deliberation process faces when dealing with scientific and technological advice, especially at the early stages of understanding of new phenomena when there is no 'independent arbiter' to call upon to resolve differences of opinion. From a policy perspective, we believe that an open, informed debate that actively encourages alternative perspectives and analyses is vital for ensuring that such debates are not short-cut by particular bodies with particular interests.

Sources and handling of advice

Don't shoot the messenger

14. On publication of the LSE Identity Project reports, many experts contacted us with their ideas, comments and suggestions. We received a high level of interest

⁶Whitley E A and Hosein I (2001) Doing politics around electronic commerce: Opposing the Regulation of Investigatory Powers Bill. In *Realigning Research and Practice in IS Development: The Social and Organisational Perspective* (Russo N, Fitzgerald B and Gross J I D eds.) 415–438, Kluwer, Boise, Idaho.

from Parliamentarians, industry representatives, technology and policy experts and members of the general public from around the world. What we were not expecting, however, was the response from Government officials and Ministers, many of whom launched spurious, misleading and ad hominem attacks on the reports and its authors. We detail these attacks, and our repeated responses to them on page 2 of our *status report*.

15. Throughout this time, we have had the unwavering support of the Director of the LSE and the LSE Council, who have strongly defended “the right of any member of the School to contribute to areas of public policy development in which they had expertise”. See ⁷ for a recent example of this support. This support was invaluable to us and there is a real risk that other researchers might not receive such support in response to similar attacks on the reputation of their institution.

Policy Laundering

16. Elsewhere⁸, we have defined policy laundering as “a practice where policymakers make use of other jurisdictions to circumvent national deliberative processes”. This has been particularly noticeable in the debates about the ID cards scheme, where ministers have continually referred to “international obligations” for passports and travel documents, drawing on internationally agreed standards defined by the International Civil Aviation Organization (ICAO).
17. The Home Office has repeatedly claimed that ICAO requires the introduction of biometric passports and that, if the identity cards are to be used as travel documents, they must meet these requirements.
18. As we made clear in our briefing note to the House of Lords⁹, there are significant differences between ICAO requirements and the proposed use of biometrics for the ID cards scheme. Amongst the key differences are the number of fingerprints taken, whether templates are taken of the face and iris, or if they are just stored as images.

⁷<http://news.ft.com/cms/s/d429d28c-945a-11da-82ea-0000779e2340.html>

⁸Hosein I (2004) The Sources of Laws: Policy Dynamics in a Digital and Terrorized World. *The information society* **20(3)**, 187–199.

⁹LSE Identity Project (2006) *All party Briefing for report stage*. Report Archived at <http://is.lse.ac.uk/IDcard/VolCardBriefing.pdf>

Relationship between scientific advice and policy development

Design of the system

19. There are many ways to design even the simplest technologies that will cause a significant difference in outcome for society. Whether it was the intention of the designer, early applications and market opportunities, the social norms at the time, or a myriad of other factors, small decisions can transform the way our society works.
20. We noted in our *main report* (chapter 18) that “the controversy, challenges and threats arising from the Government’s identity proposals are largely due to the technological design itself” and “some of the larger decisions regarding the architecture of the scheme are already decided, and are encoded within the bill”.
21. Relatively simple choices, such as which department or ministry is responsible for the design of a government infrastructure, may radically shape future policy decisions, and may even determine entire courses of action.
22. When the Home Office is the proponent and selector of an infrastructure as vast as an identity system, the choices made in the basic design of the system will reflect the interests and expertise of the Home Office. This is particularly important in the design of an ID scheme, given that its design goals include not only combating crime, but also enabling e-government, enhancing trust in commerce, and providing the ‘gold standard’ for identity in Britain. The Home Office’s design choices are in stark contrast to the system being developed in France, emerging from the Ministry for the Civil Service, State Reform and Spatial Planning. The ID Card Bill for the UK proposes a massive complex centralised system with an audit trail that focuses on identification, while the French system proposes a simpler decentralised and user-oriented system that focuses on confidence-building.
23. In other areas, however, the Home Office appears to be much more flexible with proposed details of the system. For example, it has recently proposed the use of a web portal for viewing / verifying the audit trail details held on the NIR and the use of chip-and-PIN authentication and one-time passwords for verification if biometrics are not to be used to verify that the person presenting the card is its true holder. We are unaware of any costings or market soundings about these particular technological developments.

The status of expert advice

24. The parliamentary debate about the ID cards scheme has demonstrated an inconsistent usage of expert advice by the Home Office. Where advice appears to support the Home Office position, it is accepted without question and contrary

evidence from the same source is overlooked. For example, on November 15th, 2005 Baroness Scotland referred to a study by the US National Institute of Standards and Technology and claimed that this work, which had a sample size of 6 million fingerprints and used data collected in operational circumstances, “showed a performance consistent with the needs of a scheme on the scale of the ID cards scheme”. Ignoring the fact that we are (still) unaware of the particular study that made such strong claims for the reliability of the technology in operational circumstances, another NIST report states that many of the problems with misidentification of biometrics can be attributed to “lower operational quality controls” during the collection process¹⁰, i.e. that there are likely to be very real operational issues associated with the rolling out of the biometric enrollment and verification process.

25. On other occasions, the Home Office appears to take the most positive reading of the available evidence to support its case. For example, on January 23rd, 2006 Lord Bassam said “The identity card programme has been through, and completed, an extensive market sounding and card durability survey with leading international card and chip manufacturers. The manufacturers confirmed that a card life of 10 years *is viable* and provided evidence where they have guaranteed that card life” (emphasis added). ICAO have suggested that “States may wish to consider setting the maximum validity of their travel documents to 5 years”¹¹. Amongst the reasons they give are: “Most Chip applications assume a chip/smartcard validity of 2–3 years—how such technology will perform over 5–10 years is yet to be tested in real world applications as the technology typically has not been deployed with consumers for that length of time”. Given that the cost of issuing replacement cards is a relatively minor aspect of the whole programme, the Home Office insistence on this point is rather puzzling.
26. The ICAO also suggests a five year validity period for travel documents because “Biometrics technology is changing at a rapid rate, so a shorter validity period enables re-enrolment using more sophisticated technology” and “Performance of

¹⁰NIST (2005) *The Myth of Goats: How many people have fingerprints that are hard to match?*, Report NISTIR 7271 Archived at http://www.itl.nist.gov/iad/894.03/pact/ir_7271.pdf

¹¹ICAO (2004) *Biometrics deployment of machine readable travel documents*.(ICAO), Report Archived at <http://www.icao.int/mrtd/download/documents/Biometrics%20deployment%20of%20Machine%20Readable%20Travel%20Documents%202004.pdf> Page 47

biometrics can tend to decline over time (eg compare 10 year old photographs vs 5 year old photographs)¹². Contrast this with the Home Office response to the LSE alternative blueprint which stated “Quote from the National Physical Laboratory report ‘Feasibility study on the use of biometrics’: ‘in the case of facial recognition it would seem advisable to update the templates at least every 10 years. Fingerprints and iris should be considerably more stable’. Thus, we would not need to retake biometrics for the majority of citizens during the 10 year validity period of their passports¹³. Retaking biometrics for a large proportion of the population is likely to be costly, which might explain the *political* choice for ignoring this alternative reading of the evidence.

Radio Frequency Identification (RFID) tags

27. This issue about the nature of the chip on the ID card has arisen recently and suggests some confusion about the adoption of ICAO standards. For a full explanation of the consequences of this confusion, see¹⁴.
28. On December 7th 2005, Andy Burnham gave a written answer stating “The identity card scheme will secure information on the identity card through a number of methods, including the use of anti-skimming technology. The identity cards programme has reviewed technical methodologies for anti-skimming measures for contactless cards which are compliant with International Civil Aviation Organisation (ICAO) recommendations for machine-readable travel documents” [32084] but on December 13th 2005, the Minister gave a written answer stating that “There are no plans to use radio frequency identification tags in ID cards” [32082]. However, on October 10th 2005, the Minister gave a written answer that said “We are considering the use of ‘contactless chips’, which contain radio frequency chips” [9551].

Treatment of risk

System implementation

29. In our *status report* (page 18) we noted that “the accumulated independent evidence on large complex IT projects is that they have been and always will be

¹²Ibid

¹³Home Office (2005) *Home Office Response to The London School of Economics’ ID Cards Cost Estimates & Alternative Blueprint*. Report Archived at http://www.identitycards.gov.uk/library/Response_LSE_Alternative_Blueprint.pdf

¹⁴The Register (2006) ‘RFID tag’ – *the rude words ID card ministers won’t say*. Report Archived at http://www.theregister.com/2006/01/30/burnham_rfid_evasions/

high risk in terms of implementation and unanticipated costs. The key risk dimensions include high complexity, large size, innovativeness of technology, integration issues, number of units and stakeholders affected, over-ambitious time-scales, and over-reliance on technologists/IT suppliers for development and implementation". A similar point was made in a recent report from the House of Commons Committee of Public Accounts¹⁵.

30. One way of addressing public concerns about such risks would be to include explicit statements of what the project team does not know, and what the major risks are, in *all* major policy documents. Similarly, they should make explicit a variety of alternative scenarios for pessimistic, medium and optimistic outcomes in *all* documents, instead of simply providing confident statements of costs and benefits at the front end.
31. Despite the 'design' of the ID cards scheme having been fixed as early as 2002 there is a growing concern from industry about the lack of openness about the implementation of the ID cards scheme. For example, EURIM notes that "*None of the potential suppliers have had sufficient access to specification of what is intended or who is to be served to be able to provide costings of any reliability.* There is no evidence that the potential private sector partners with experience of running supposedly similar operations (e.g. financial services) have been consulted in any more depth" (emphasis added). They continue: "The experience of financial services industry security experts on the attitudes and experience of others they met at an open consultation meeting suggest that there is a gulf of understanding between those running systems under regular and sophisticated attack and those who are not under such pressures"¹⁶.
32. In a similar manner, Intellect, notes that "far more discussion is still required before Government will be in a position to make informed decisions on all of the proposed technologies including biometrics, but also data management, security, authorisation/authentication, storage and data sharing between departments. The only way that Government will be able to develop an ID Card scheme built on reliable technology and capable of delivering on its promises to citizens will be if it has a comprehensive understanding of the industry, its capacity and its capabilities. Regarding the technology which will enable the project it is industry's belief that the scheme should be built on technology and business

¹⁵House of Commons Committee of Public Accounts (2005) *Achieving value for money in the delivery of public services*. Report HC742 Archived at <http://www.publications.parliament.uk/pa/cm200506/cmselect/cmpublicacc/742/742.pdf>

¹⁶<http://www.eurim.org.uk/activities/pi/060112pireport.pdf>

processes that have been proven in existing implementations around the world. And that the only way that Government will achieve this is by talking to industry, *being honest about their requirements*, and listening to industry's advice" (emphasis added)¹⁷.

The ID cards scheme as an infrastructure

33. Since it was first proposed in 2002, the Identity Cards proposal has failed to win universal support amongst central government departments. The Home Office intended the ID cards scheme to provide a gold-standard identity infrastructure for use by all government departments and one would expect that if these other government departments were confident of the Home Office's ability to deliver the scheme successfully they would have no problem being compelled to integrate their own systems with the ID cards scheme. However, the present Bill places no obligation on departments to make use of the scheme.
34. Not mandating the use of the ID cards scheme across government suggests major concerns with the project and goes against the stated government policy of providing joined up government. Furthermore, despite a three and a half year marketing effort to the rest of government, the Home Office has failed to achieve formal buy-in to the scheme, with most Departments and agencies responding to a series of Parliamentary questions, posed to clarify this matter, using a fairly standard, non-committal answer, typically of the form that the Department in question "has, in consultation with the identity cards programme, developed its current best estimate of the costs and benefits of using the ID cards scheme to enhance its services and these have been incorporated into the business case".
35. The distinction between infrastructures and stand-alone systems helps explain, in part, the discrepancy in cost estimates between the LSE and the Home Office. Our figures always included set-up costs, running costs and costs of integration with other Departments. The Home Office figures, we now understand, are "The current best estimate for the total average running costs for issuing passports and ID cards to UK nationals is £584 million per annum. The Home Office is not breaking this cost down further, *nor publishing details of set-up costs*, because this information is commercially sensitive and discussion of more detailed estimated costs may prejudice the procurement process by limiting the Department's ability to secure value for money from the market" (emphasis added).[21354]

Untested technology

36. For the project to work, a relatively new and untried technology has to be made to work, and known shortcomings have to be resolved. The government was

¹⁷http://www.intellectuk.org/press/pr/pr_190106_id_card_debate.asp

relatively late in starting to spend any money on investigating how well the technology actually works and what needs to be done to overcome current limitations. There is a significant risk that the technology will never work well enough in practice for a large-scale public domain application, and large amounts of money will be lost if this is discovered too late in the project.

37. We have been repeatedly struck by the deep-seated, fervent belief, held by ministers and top project team members, that the technology can be made to work. This belief is literally unshakeable. However, the basis for this confidence is unclear (unless it is based on companies telling them that they can fix current shortcomings). When ministers are pressed on this point, they typically resort to avoiding the question and restating the fact that strong identity management is needed and that something must be done in this area.

Transparency, communication and public engagement

Purpose of the system

38. The reasons given for the introduction of the NIR and use of biometrics do not hold when even a basic risk analysis is conducted as a closer inspection shows that identity only plays a small role in many of the issues raised. This is particularly evident in press comment about the recently updated 'figures' for identity fraud¹⁸. For none of these cases has the government presented a complete solution required to tackle it, so that a proper cost-benefits analysis case for the NIR can be undertaken. Indeed, in the worst case, identity cards could actually reduce the ability to deal with the listed problems, because too many resources have been spent in this area to the detriment of other activities.

Consultation

39. Issues of design become particularly important when seen in conjunction with the formal consultation process that has been undertaken by the Home Office. All of the consultations to date raised concerns and observations regarding law, social exclusion and technology, as we detailed in chapter 5 of our *main report*. Few of these have been reflected in the final bill. In fact, we noted, "the

¹⁸"To support the claim of the £1.7 billion 'cost' of ID fraud, the Government cites a figure of £395 million 'lost' to money laundering. But on closer examination, it turns out the Government has no idea how much money is laundered, or indeed how much of this is directly attributed to identity fraud. The figure on which a minister of the Crown is talking on national radio, it turns out, is entirely 'illustrative'. The figure of £1.7 billion becomes even more ridiculous when you realise that it assumes a zero level of ID theft once cards are introduced, when there are good arguments to suggest the scheme will actually make ID fraud much easier for sophisticated criminal gangs" A £1.7 Billion red herring. Comment, The Daily Telegraph, February 3rd, 2006

government's plan for the ID card has changed little since the beginning of its gestation". The first Home Office consultation document, issued in 2002¹⁹ (using the term "entitlement cards") presents the design of the scheme as a central database, secure procedures for establishing entries on the central register and for keeping the information up to date, links between the central register and information held on other systems and the issuing of plastic cards to everyone on the central register.

Responses to consultation

40. We noted in our *main report* (pages 33/34) that as part of the formal consultation process, the lobby group Stand.org.uk set up a portal to allow people to send their comments to the Home Office easily. This resulted in 5031 responses, overwhelmingly against the Scheme. In its review of the consultation process, the Home Office appeared to count these 5000+ responses as a single response arising from an organised campaign and hence was able to claim that 61 percent of responses to the consultation were positive.

Formal reviews

41. We understand that the ID cards scheme has undergone two formal OGC gateway reviews and that the methodology used for costing the project has been assessed by KPMG.
42. We note, however, that neither of the reports (or even the 'scores') for the OGC gateway reviews have been released and the KPMG report was only released as an "extract". There might be good reasons, in terms of enabling a full, frank and open reflection of possible problems with the project at the time, for keeping the details of the OGC reviews private, however, the Home Office's continued reliance on the reason of "commercial sensitivity" for failing to reveal this information is doing little to improve public confidence in the scheme.

Evaluation and follow-up

Technology neutral policy

43. The question of whether to go for technology neutral policy is an important one for legislators. A technology-neutral policy has the advantage of not needing to be updated whenever there are significant changes to underlying technologies. The disadvantage, as we have argued elsewhere²⁰, is that all too often,

¹⁹http://www.identitycards.gov.uk/library/entitlement_cards.pdf

²⁰Hosein I, Tsiavos P and Whitley E A (2003) Regulating Architecture and Architectures of Regulation: Contributions from Information Systems. *International Review of Computing Law and Technology* 17(1), 85-97. Whitley E A and Hosein I (2005) Policy discourse and data retention: The technology politics of surveillance in the

technological issues are fundamental to the way the technology is understood and regulated. For example, arguments about the regulation of e-mail are very different if one is considering SMTP communications (as used in most e-mail packages) versus HTTP communications (as found in hotmail and googlemail, which are based on web browsers). It appears that the Home Office's plans to address this issue has been to specify the broad design in the legislation, but leaving much of the technological detail to secondary legislation, much of which has not been introduced yet, a point also raised by the House of Commons Home Affairs Committee²¹.

The sense of inevitability

44. The Home Office, and at times the Prime Minister, have pushed the notion that the identity cards policy is inevitable. The purpose of this imagery is to indicate that Parliament's consent to this scheme is merely a formality and a re-affirmation of the direction that the world is going, once again implying a short-cutting rather than due-process view on scientific and technological advice. Such statements vary between the softer 'ID Cards are an idea whose time has come' to the more emphatic claim that 'without regard to Parliament's decision on identity cards, biometric passports collecting iris, finger and face scans are an inevitability'.

Implementing organisational or technological change

45. Government clearly wants to do something to fix problems it recognises. However, actually fixing the problem often requires changing the way people do things. Changing behaviour is hard, and you risk the wrath of those people who generally don't like change because it is extra work. So instead, the government proposes technological solutions, which may also mandate organisational change ("because the technology says so"²²). The technological changes also have the benefit of being more visible than organisational changes.

United Kingdom. *Telecommunications Policy* **29(11)**, 857–874.; Hosein I and Whitley E A (2002) The regulation of electronic commerce: learning from the UK's RIP act. *Journal of Strategic Information Systems* **11(1)**, 31–58.

²¹House of Commons Home Affairs Committee (2004) *Identity cards*. Report HC130–1 Archived at <http://www.publications.parliament.uk/pa/cm200304/cmselect/cmhaff/130/130.pdf> Para 222

²²Neil Postman (1992) *Technopoly: The surrender of culture to technology*. Vintage Books, New York says "I am constantly amazed at how obediently people accept

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explanations that begin with the words ‘The computer shows ...’ or ‘The computer has determined ...’. It is Technopoly’s equivalent of the sentence ‘It is God’s will’, and the effect is roughly the same”. Page 115