Trust and Ethics in e-Science Agenda Setting Workshop

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The workshop was held at St Cross College on 11th September 2006.

The aim of the workshop was to outline an agenda of research which would address the challenges posed by concerns about trust and ethics in e-science. The workshop was attended by delegates from a wide variety of interest groups: actual or potential users of e-science technologies, designers and developers, ethicists and social science researchers, usability and requirements experts.

The background to the perceived need for this agenda:

- In 2004 the UK e-Science Usability Task Force identified trust and ethics as important challenges to the usability of e-science applications. Their report noted that research in these areas was needed in order to understand what the most pressing issues in trust and ethics are, and to set in place strategies for addressing them. The report can be found here: http://www.cs.nott.ac.uk/~tar/UTF.pdf

- An early workshop on the topic of 'Ethics in e-Science' was held on 12th December 2005. This workshop resulted in a broad overview of the ethical themes beginning to emerge in e-science, and the conceptual frameworks which could be used to address them. A report of the workshop can be found here:http://www.oii.ox.ac.uk/microsites/oess/Carusi_Ethics_Workshop_2005_Report.pdf

The *Trust and Ethics in e-Science Agenda Setting Workshop* aimed to focus more specifically on the concerns in trust and ethics which posed major challenges to the usability of e-science applications. It confirmed many of the central themes of the previous workshop, but also raised further focal areas of concern and prioritised these areas of concern into a research agenda.

By their nature concerns about trust and ethics occur in human and social relationships and contexts. Three main trust and ethics areas of concern emerged:

The researcher-researcher relationship

- What motivations are there for data and resource sharing, and what risks do researchers take when they share or contribute to databases?

- How does grid- or Internet-enabled collaboration change the ways in which researchers trust each others' abilities, competence and scientific practice, technical and other skills, and disciplinary values and priorities?

- Much scientific practice is not explicitly reflected upon by scientists and this can often be a barrier to grid or Internet enabled collaboration. How much of these implicit scientific practice need to be understood by collaborators and others, and how can this understanding be facilitated?

- In what ways can the design of e-science applications support trust in relationships among researchers? To what extent can e-science engender different trust relationships, both in the technologies that it uses and in the social and institutional relationships in which the technologies are embedded?

- Trust among researchers is not independent of the trust that researchers have in e-science itself, and in the technologies that are used for e-science. How is the overall scientific process affected by e-science applications: for example, does it become more transparent or does e-science facilitate the replicability of results. Is the integrity of the scientific process is maintained or enhanced by e-science applications and modes of undertaking science, and how can this be entrenched into the e-science culture? The notion of epistemic trust was put forward at the workshop: that is, trust in the knowledge outcomes of e-science.

- The researcher-data subject relationship

- When researchers work with data derived from human subjects, many of their concerns about the use to which data is put by other researchers are motivated by ethical concerns about the privacy and anonymity of the data subjects, or about confidentiality and the possible infringement of the consent given by data subjects for the use of their data. The most important concerns in this regard are clustered around the re-use or secondary use of data. There are legal constraints as well as professional and personal ethical constraints on accessing and dealing with data. Can e-science applications be developed to support existing practices? If these applications could change existing practices, how to ensure that they are developed in socially and ethically responsible ways?

- What, in fact, are the public's and data subjects' expectations with respect to the way data is stored, shared and accessed? How can these expectations be understood and how can they inform the overall ethics process as well as e-science applications?

The relationship between e-science researchers and the public

The public understanding of e-science was considered to be paramount. For example, it affects the way in which data subjects respond to their data being used for the purposes of e-science, and the ability of e-science applications to guarantee the integrity of the scientific process will be central to policy makers and the general public's overall support for e-science. There is a pressing need to build into design public understanding initiatives into e-science applications and the social and institutional settings in which they are embedded, in order to ensure that there is public trust in e-science.

While the focus of the workshop was trust and ethics as challenges to usability, it was in fact difficult to distinguish a clear-cut category of e-science 'users'. Researchers themselves are the most important category of users, and in a significant number of

cases (especially in these relatively early days of e-science) they are also the most important category of developers. Data subjects themselves could be users of e-science, if developments to make data more accessible to data subjects are incorporated into e-science applications. In the interests of transparency, the public and policy makers are also likely users of at least some aspects of e-science technologies.

General issues that cut across each of these relationships are the following:

- A strong theme at the workshop was the difficulty of distinguishing between trust in the artefacts and trust in the people who use the artefacts. The importance of broaching these as socio-technical systems was underscored.

- Socio-technical systems, however, raise pressing questions regarding autonomy, ownership and responsibility. These are notions that cut across all of the relationships in e-science, and require further work to be addressed.

- Different ways of conceptualising the issues clustered around trust were mooted at the workshop and need further exploration: trust, trustworthiness, confidence, reliability.

- With respect to ethics, a dominant theme was the need to distinguish between different kinds of ethics: for example, the distinction between morals (people's actual practices, values and commitments) and ethics (the conceptual understanding and normative assessment of practices and commitments). It was clear that the understanding of the moral and ethical aspects of e-science need to inform the formal ethical requirements and clearance process which was highlighted as one of the most daunting obstacles to e-science projects using data subjects, and thus affecting medical and social science applications in particular.

The last session of the workshop was spent in setting out an agenda for researching trust and ethics in e-science. There are two parts of this. The first is an agenda in terms of topics of research, and the second is an agenda regarding implementation.

Topic agenda

1. The benefit to the public and / or to individuals of e-science.
2. Public perceptions / expectations of science / e-science.
3. Methods to be used for understanding public perceptions and expectations, and for promoting public understanding and engagement.
4. Transparency of the scientific process, of the consent process and of the use of data: questioning the importance to researchers, data subjects and public, and considering alternatives.
5. Researcher/ researcher trust issues and collaboration styles and processes.
6. Appropriate and effective 'metrics' in e-science /e-research, and the effect of audit trails.
7. Trust and trustworthiness in e-science:
   a. Could a reputation-building mechanism work for e-science?
   b. How to study how trust emerges in multidisciplinary contexts?

c. How do researchers engender trust?
   d. How to design for integrity and epistemic trust?
   e. What role is played by metadata?
   f. Regulation / governance or e-science
      i. What degree of oversight is right for e-science?
      ii. Is there a role for certification?
   g. What possibilities are offered by data enclaves / archives / safe settings?
8. Research subjects' engagement with research
9. Covert research and secondary use.
10. How do we evaluate / achieve the social value of e-science, eg increased trust in science (economics/ethics/social).

Implementation agenda

An exploration of each of these topics should issue in specific recommendations for which appropriate implementation strategies will be required. The implementation strategies include technical and system design implementations, legal, ethical (ethics committees, guidelines, policy), professional ethics bodies, institutional, social and cultural. Often a combination of these strategies will be required. An implementation strategy is an integral point of each topic on the agenda.

A discussion forum for this topic, and for initiatives on taking forward the agenda, has been established. Please contact Annamaria Carusi if you would like to join (annamaria.carusi@comlab.ox.ac.uk).