Institution: Middlesex University

Unit of Assessment: 11 – Computer Science and Informatics

Title of case study: Applied Ethics – embedding ethics in the design of technology projects

1. Summary of the impact

Within the field of 'computer ethics', considerations of the design processes required for software development has remained relatively neglected until the foundational work of Dr Penny Duquenoy under the direction of Prof. Harold Thimbleby helped introduce and establish the need for such concerns. The impact of the embedding of ethics in technology is observable by noting the routine use of ethics expert reviewers and evaluators and on Advisory Boards in EU funded projects since 2007. This has been replicated by the EPSRC who also now include input from ethics experts into their programmes such as the RCUK 'Global Uncertainties' initiative. At a professional level, ethics has also become a core consideration for the British Computer Society and its representations to the community it serves.

2. Underpinning research

The original research undertaken by Dr Duquenoy was first done as a part of doctoral research supervised by Prof. Harold Thimbleby from 1997-2001. The research set out to un-ravel the complexity of ethics surrounding the emergent Internet and offered four perspectives (technical, conceptual, regulatory and ethical) to help draw out insights for an ethical framework of understanding the internet and provide instruments for leveraging analysis of other technology and ethics issues.

Two research papers [1, 5] set out to contextualise the impact of programming when subject to Rawls' Theory of Justice. Issues of malfunctioning computer programmes, unreliability of devices and the need for programmers to view their activity as both a political and ethical activity were discussed. In particular, the user interface of software provided the fulcrum for such considerations. This research initiated the thinking that suggested that ethical considerations should be central to the software construction process and ultimately to design.

This line of research further considered the study of ethics in the context of consumer electronics [4]. Here Duquenoy and Thimbleby reported that the perceived safety of vehicles conforming to set standards is at odds with the complexity of instruments such as radios and maps available in vehicles. A key conclusion being the need to embed ethical considerations in the design process.

Other research utilising Jurgen Habermas's discourse ethics has been used to bear upon the assessment of moral norms pertaining to the Internet such that for a norm to be morally valid those relevantly affected must be able to accept the consequences of its being put into practice [2].

Following the development of ethics in software as a research strand at Middlesex, Dr Duquenoy led on a EU FP7 project (SIS8-CT-2009-230291) exploring the ethical governance of emerging technologies. In particular the research developed strategies for integrating ethics into technical development of products and projects. Recognising that technological innovation is socially constructed, the project proposed that value based design is one approach to integrating considerations of values such as ethical and moral concerns [B]. The use of value based design is now continuing into a current externally funded research project aimed at developing technologies for young offenders [C].

Further emphasising the timeliness of the research in ethics and computing, at the same time, Dr Duquenoy participated as co-investigator on the EPSRC funded project (EP/F035454/1) ISIS, exploring ways of protecting children in online social networks [A]. One outcome from this research sought to discuss public involvement in law-enforcement technologies and proposed approaches to provide an ethics centred consultation process with stakeholders contributing to the design and deployment of target software packages [6].

The range of work on ethical assessments of emerging technologies was synthesised into a meta methodology as part of a collaboration with Dr Richard Jennings at Cambridge University and others that provides a framework for ethical assessment that can be integrated with mainstream software development processes [3].

3. References to the research

This research was based on competitively funded projects, with robust peer review systems. The outcomes from the research were published in leading peer review journals and conferences in the field.

1. Duquenoy, P. and H. Thimbleby, *Justice and design*, in *IFIP Conference on Human-Computer Interaction*1999. p. 281-286.
2. Duquenoy, P., H. Thimbleby, and S. Torrance, *Towards a synthesis of discourse ethics and Internet regulation*, in *Proceedings: ETHICOMP 99*, A. D'Atri, et al., Editors. 1998.
3. Harris, I., et al., *Ethical assessment of new technologies: a meta-methodology.* Journal of Information, Communication and Ethics in Society, 2011. **9**(1): p. 49-64.
4. Thimbleby, H., P. Duquenoy, and G. Marsden, *Ethics and consumer electronics*, in *Proceedings of the 4th ETHICOMP International Conference on the Social and Ethical Impacts of Information and Communication Technologies—Ethicomp'99*1999.
5. Thimbleby, H., P. Duquenoy, and D. Whitehouse, *Just Programming*, in *ETHICOMP2001*2001: Technical University of Gdansk, Poland. p. 83-91.
6. Watson, P.G., et al. *Towards an Ethical Interaction Design: the issue of including stakeholders in law-enforcement software development*. in *Proceedings of the 21st Annual Conference of the Australian Computer-Human Interaction Special Interest Group: Design: Open 24/7*. 2009. ACM.

There are three key funded research projects associated with research subsequent to the original research listed above:

A. 2008-2011 ISIS: Protecting Children in online social networks (EPSRC Grant reference: EP/F035454/1) 3 year project, Project Partners: Prof. Matt Jones (Swansea University, PI); Prof. Awais Rashid (Lancaster University) and CEOP. [MU: £260,325]

B. 2009-2012 Principal Investigator (PI) EGAIS: The Ethical Governance of Emerging Technologies - New Governance Perspectives for Integrating Ethics into Technical Development Projects and Applications (2009-2012, co-funded under the European Union Seventh Framework Programme FP7/2007-2013 grant agreement n° SIS8-CT-2009-230291).34 month project. [MU: €161.920]

C. "MAYOT – Mobile Applications for Youth Offending Teams". 2013. Project funded by Nominet Trust. http://www.nominettrust.org.uk/what-we-support/projects/effective-interaction

4. Details of the impact

The importance of the embedding of ethical considerations into design processes for technology and software has remained relatively neglected and it is the seminal work of Dr Penny Duquenoy that has helped introduce and establish the need for such approaches.

The impacts of the embedding of ethics in technology is observable by noting the routine use of ethics expert reviewers and evaluators and on Advisory Boards in EU funded projects since 2007. Further, this has been replicated by the EPSRC who also now include input from ethics experts into their forthcoming programmes such as the RCUK 'Global Uncertainties' initiative. While peer review of proposals is an expected contribution of academics, the specific input on the appropriate design of ethical concerns is a recent development.

The reach of the impact extends to the professional IT community, as at a professional level, ethics has also become a core consideration for the British Computer Society and its representations to the community it serves. This is evidenced by the formulation of BCS Ethics Group that reports to the BCS Trustee Board through the Institute's Professionalism Board and is chaired by Dr Duquenoy. (http://www.bcs.org/category/8620).

More recently, a report co-authored by Dr Duquenoy has been made available on BCS Ethics Group website (http://www.bcs.org/upload/pdf/ethical-assessment.pdf). The report provides a detailed ethical assessment of technologies using a new meta methodology developed by Dr Duquenoy and others [S1].

Direct beneficiaries of the research include various funding bodies such as the EU, National Science Foundation and EPSRC. They have utilised the specific knowledge and skills arising from the research to provide Expert evaluations for ethics for projects such as those for DG Information Society and Media, 2007 and on-going evaluations of ethics work packages for European funded projects.

Dr Duquenoy has provided review expertise for ethical considerations for projects funded under the NSF (2012) and the Norwegian Research Council programmes such as the ICT programme (Information Security, Identity management, Privacy) 2008, 2010; VERDIKT (Future Internet) 2011. Dr Duquenoy has also provided expert knowledge as member of Ethics Advisory Board for various completed projects (EU FP6, FP7) and a new EU project started in October 2012 – 'Accountability for Cloud' (A4Cloud).

The ISIS project [A], developed software to help police track paedophiles who masquerade as children in internet chat-rooms. This was reported in British media in 2010 [S4] and the BBC report quotes Det. Chief Superintendent Graham Hill, Child Exploitation & Online Protection Centre:
'it's probably going to be used at the early stages of the Investigation to identify people that are misrepresenting themselves on-line which is a common technique for people with a sexual interest in children, to misrepresent themselves, to ingratiate themselves into a particular group or particular child'. Other news items include the Telegraph reporting on the ISIS project [S5].

Impact beyond the normal outcomes expected from the research arising the EGAIS project [6] included a request by DG Research (EU) to provide training to funded EU projects on the ethical governance of emerging technologies. [S6].

The research has also helped shape government policy following the submission to the UK Parliamentary Joint Committee on the Draft Communications Data Bill on behalf of the BCS ICT Ethics Specialist Group and BCS Ethics Group**.** [S3].

5. Sources to corroborate the impact

The importance of embedding ethics into professional practice is supported by the following:

S1. BCS, The Chartered Institute for IT: Duquenoy, P with N. Dando and I. Harris. (2009) Ethics in the Provision and Use of IT for Business, Institute of Business Ethics, 2009. http://www.bcs.org/upload/pdf/ethics-provision.pdf and http://www.ibe.org.uk/index.asp?upid=121&msid=8
According to BCS statistics, this publication on the BCS website has received 714 page views (581 of which were unique) since it was published on 18 January 2010

S2. CIO Magazine (29/01/2010): http://www.cio.co.uk/news/3211426/it-ethics-must-be-addressed-by-cios-says-bcs/?no1x1&olo=BusinessUpdate&cmpid=BU1

S3. BCS ICT Ethics Specialist Group and BCS Ethics Group – input to UK Parliamentary Joint Committee on the Draft Communications Data Bill. August 2012

Requested by Chair of BCS Ethics Group to co-ordinate BCS response (representing BCS ethics view) to the UK Parliamentary Joint Committee on the Draft Communications Data Bill. The response sent on behalf of BCS is the document written by Duquenoy. The response document, signed off by BCS Director, is available at: http://www.bcs.org/content/ConWebDoc/47589.

S4. Funded research: *ISIS: Protecting Children in Online Social Networks.* BBC news short programme: New Software to 'vet' chatroom users' 31 May 2010 http://www.bbc.co.uk/news/10199819

S5. *"Spy software to combat online paedophiles",* Telegraph, 19/10/08 (and also cited by various other news agencies)

http://www.telegraph.co.uk/news/uknews/law-and-order/3222257/Spy-software-to-combat-online-paedophiles.html

S6. Invited by DG Research to conduct: Ethics Assessment and Review Training Workshop in EU Projects: Reflections from the EGAIS and ETICA Projects (April 26-27th 2011).