



The following is a position paper presented on behalf of the BCS Ethics Forum at a workshop forming part of a European research project on future uses of technology (see: (<http://www.fp6-minami.org/>)).

This paper describes the rationale for, and formulation of, a framework for the ethical assessment of new and emerging technologies. The framework given is a first version, currently being trialled prior to further work. Feedback or enquiries should be directed to Dr. Penny Duquenoy, Manager, BCS Ethics Forum. Email: penny.duquenoy@bcs.org.uk

Helping ICT professionals to assess ethical issues in new and emerging technologies

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Abstract

In the field of computer ethics there has been a move over recent years from the ethical assessment of technology applications already released on to the market towards a technology pre-assessment³. Anticipating the issues likely to be raised in new technological environments, such as captured by the notion of ambient intelligence, poses certain challenges to the practicing professional. Whilst great headway has been made in raising awareness of the ethical dimension of technology and its applications with those engaged in the industry, the philosophical and theoretical concepts of ethics are not usually part of the general skill set demanded at the workplace.

This contribution will present the foundation of a framework for ethical assessment that can be applied to new and emerging technologies in ways that are accessible to practicing professionals. Using examples of application areas as test cases, we will explore the possibilities and limitations of the framework in scenarios that, although forward-thinking in concept, use applications currently under development.

Introduction

Much of the early body of work on the ethical aspects of ICT rests on principles put forward in western ethical theory as a means of determining what the moral problems might be – i.e. using an analytic practice from the domain of philosophy. Although this type of exercise is useful to draw out underlying, and non-obvious, issues it is not a familiar way of working to most professional practitioners. Applied

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² The work of the British Computer Society ethics forum is to support ethical practice and raise awareness of the importance of ethics in the development and use of today's technologies. See: www.bcs.org/forums/ethics

³ The MINAmI project, for example.

ethics can be challenging for non-philosophers, given that it is conceptually distant from their domain of professionalism.

In attempting to provide an accessible method for ethical reasoning, Mason et.al. (1995) propose four fundamental questions to provide a focus:

- Who is the agent? (including their motives, interests and character)
- What action was taken or is being contemplated?
- What are the results or consequences of that action?
- Are those results fair or just?.

These fundamental focussing questions, rooted in the two main classical ethical traditions (teleology and deontology) seem to be suitable for many types of ethical decision making. In particular, at a critical point when an ethical decision ought to be made, noted by the authors as a “moment of truth”.

However, when assessing new technologies, the ethical questions will often necessarily be more abstract. The agent might not be determined. The possible actions might be unknown and possible results highly uncertain. The question of fairness and justice based on a range of possible outcomes is valid, but is it sufficient on its own?

In teaching information technology undergraduates about ethics and technology, the use of frameworks is seen as helpful in showing how existing guidance, such as law, codes of conduct, and principles from ethical theory can each be used to further ethical thinking (see for example Kallman and Grillo, 1996).

Frameworks are not only helpful in providing direction for thinking but, as they take a more abstract and generic approach, they can be useful for looking at uncertain technologies.

The Framework - DIODE

The framework developed by members of the BCS Ethics Forum Strategic Panel is a meta-methodology which uses flowcharts and checklists to help people assess ethical issues in new technologies. It provides a framework that enables its users to deploy tools and techniques of their own choosing, while also providing access to helpful tools, techniques and templates. It rests on a 5 stage process: Define, Issues, Options, Decision and Explanation – hence the name DIODE.

The aim of the framework is to provide guidance and leadership on assessing the ethical issues arising from new technologies from two different angles:

- the strategic/abstract assessment of a new technology,
- a project/application specific consideration of potential research, development or deployment using a new technology.

The types of organisation likely to be undertaking a strategic/abstract assessment include, for example: a government, quasi-government, policy or research body assessing ethical issues that might arise from the use of a new technology (e.g. RFID, Smart Dust, Biometrics, Nanotechnology, Robotics); or a commercial organisation contemplating the use of such a new technology for the first time.

The types of organisation undertaking a project/application specific consideration include: a commercial organisation, inventor or product designer considering a piece of research, development and/or deployment of a new technology; a research body planning a specific piece of research into (or using) a new technology; or an individual planning to undertake research, development and/or deployment of a new technology.

Using a flow chart and appropriate set of check-lists (strategic/abstract, or project/application) the 'assessor' is led through a series of questions that fall under the categories: Define, Issues, Options, Decision and Explanation. When completed the checklists will have not only clarified thinking with regard to the technology, they can be kept as a record for the assessor to remind them, or others, of how the decisions were arrived at – useful for any 'ethical audit'. In many cases it will also be appropriate to place the findings of a DIODE assessment in the public domain.

Testing and evaluating the framework

The framework is currently at an early stage, and is now being tested against case studies (both strategic/abstract and project/application). The aim is to be able to report the results towards the end of September and present them to the MINAmI participants. Part of the evaluation process will be to present the framework to the participants for their feedback.

The next stage in the development of the framework will be to make adaptations based on the results from the case studies and feedback received. Further testing against other cases will be undertaken.

Conclusion

As technology progresses and its application extends beyond the world of commerce into the public domain, supporting and changing lifestyles, it is crucial that prior understanding of potential ethical issues be gained. There is an increasing demand for taking ethical design into account throughout an IT development (van den Hoven, 2007), but without training or guidance for IT professionals this is difficult to achieve. The DIODE framework aims to provide this guidance for the IT professional by presenting relevant aspects for consideration in a way that is familiar, and accessible, to IT professionals.

References

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- Mason R. Mason F. & Culnan M (1995) *Ethics of Information Management*, Sage, 1995.
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