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Understanding the relevance of ethics reviews of ICT research in UK computing departments using dialectical hermeneutics

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Abstract

Purpose – The purpose of this paper is to attempt to investigate how Information and Communications Technology (ICT) researchers in UK computing departments address ethics in their research. Whilst research and innovation in ICT has blossomed in the last two decades, the ethical, social and legal challenges they present have also increased. However, the increasing attention the technical development receives has not been replicated in the area of developing effective guidelines that can address the moral issues inherent in ICT research.

Design/methodology/approach – This research is qualitative and made use of interviews. The data analysis was done with dialectical hermeneutics. Through a dialectical hermeneutic process, this research unpacks different understandings of relevance attached to ethics reviews of ICT research in UK computing departments.

Findings – The findings include that ethics reviews are relevant because; it is a moral duty, it improves trust for researchers, it is part of risk assessment, it is in compliance with the law and it is a sustainable act.

Practical implications – These various understandings illustrate an important dialectic process on the current state of the art in ICT research.

Social implications – It asks to what degree the currently dominant model of ethics review based on biomedical ethics is optimal to ICT.

Originality/value – It proposes a framework that can effectively help researchers and administrators to ensure responsible research and innovation in ICT. Finally, it identifies that ICT researchers would benefit from the developing repertoire of responsible research innovation.

Keywords Ethics, Sustainability, Hermeneutics, Trust, Risk assessment, Information ethics

Paper type Research paper

1. Introduction

Over the last few decades, there has been a great deal of research in the area of Information and Communications Technology (ICT). Such research has blossomed to the benefit of business, individuals and the public, and has led to significant social, economic and legal changes. Many aspects of human life have been altered: commerce, employment, medicine, security, transportation and entertainment. In essence, ICT has significant impact on our society. It also leads to an increasing array of ethical and social challenges which gives rise to social policy vacuums (Moor, 1985, p. 266). However, whilst there is a continued concentration on the technical issues involved in ICT research, less attention has been paid to the development of guidelines that address the moral issues inherent in such research (Eke, 2012).

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ICT provides a valuable vehicle for research in many fields as well as being a rich area for research in its own right. However, there remains a gap in policy or guidelines on how to carry out ICT research ethically. The nature of ICT research and development leaves ICT with distinct problems, such as the distancing effect of technologies which may encourage unethical behaviours (Bissett, 2005, p. 2); hazards such as North Atlantic Treaty Organization (NATO) scientists creating a computer virus called Anti Smyser 1 by mistake, causing military secrets to find their way onto the Internet; constant invasion of people's privacy and so many unintended consequences (Weckert and Lucas, 2013, pp.188-189). Thus, one can say that ICT research gives rise to varying levels of serious ethical problems and therefore requires an adequate regulatory model. Ethically reviewing ICT research is therefore considered necessary. To underscore this point, the European Commission has made it mandatory that all ICT research under its seventh framework programme should comply with certain ethical standards so as to ensure that scientific and technological development happens within a framework of fundamental ethical principles and on the basis of agreed practices that can inspire the rest of the world.

There is currently little evidence on how ICT researchers in UK computing departments deal with ethics. Anecdotal evidence suggests that some do not understand or vehemently reject any relevance attached to ethics reviews with regard to their research projects. The belief among these researchers seems to be that nothing they are currently doing raises ethical problems. This may either be based on their lack of knowledge of what ethics is or what ethical issues can be/is involved in ICT research. If this anecdotal evidence is correct and at least some ICT researchers reject the relevance of ethics for their work, then this constitutes a potential problem in light of the ethical qualities of ICT outlined earlier. This potential contradiction between the broader ethical and societal relevance of ICT and the attention such issues are given in day-to-day ICT research motivated the current study, which set out to explore how ethics reviews are dealt with in UK computing departments, concentrating on how relevant ICT researchers consider ethics review processes as well as established ways of dealing with ethics in other disciplines.

This journal is a valid avenue of presenting the findings of this research (partially funded by Higher Education Academy of UK) owing to the fact that it is designed for readers interested in how ethical and social issues are addressed in ICT. Discussion on ethics reviews in this paper centres on research ethics in ICT and raises issues that have received little attention in research ethics literature.

The paper starts by outlining and defining the subject area of ICT. It then presents the methodological approach and explains the principles of dialectical hermeneutics as the chosen method of data analysis. This leads to a discussion of the main findings. These provide the basis for the recommendations in the conclusion.

2. Understanding ICT

To understand ethical issues of ICT, it helps to have a clearer grasp of the concept of ICT in the first place. Literarily, ICT is concerned with the *communication* of *information* through *technological* artefacts. It is a concept that involves the *production* and *usage* of scientific artefacts which can be used to convey or exchange information in different ways. Examples of such artefacts include computers (pcs, macs etc.), satellite systems, digital television, mobile phones, radio, network systems, robots and various other

hardware and software systems. Basic features of these ICT products include information retrieval, storage, processing, communication, manipulation and receipt.

The above explanation finds reference in Toomey (2001, p. 1) who defined ICT as:

> […] *those technologies that are used for accessing, gathering, manipulating and presenting or communicating information. The technologies could include hardware (e.g. computers and other devices); software applications; and connectivity (e.g. access to the Internet, local networking infrastructure, videoconferencing*).

This is a concept that has blurred the lines between Information technology, computer technology and media technology. Technically, ICT represents the increasing convergence of different defining technologies of our time and the rapid change that characterises both the technologies and their use.

With such defining features as pervasiveness, ubiquity, malleability, interactivity, miniaturization, embeddedness, augmentation, autonomy and virtualization, ICT causes both positive and negative impacts in the society. A feature such as logical malleability makes the potential applications of ICT appear limitless because its logic applies everywhere (Moor, 1985, pp. 266-275). In a distinctive way similar to no other discipline, ICT research and development give new twists to existing research ethics issues such as privacy and intellectual property rights. For instance, research into deep brain stimulation to reveal the neural correlates of our innermost thoughts and unconscious attitudes will raise new questions on privacy (Fuchs, 2006, pp. 601-602). The increasing research into the use of nano technology in computing promises faster, smaller and lighter (possibly molecule sized) computers that may have huge impacts on society, including raising multiple and unique ethical problems of privacy. ICT's unique characteristics thus pose new versions of old moral problems or amplify standard moral dilemmas necessitating the application of moral norms in different and new ways. Some of these features and certainly their combination are unique to ICT which renders it plausible that an investigation into the ethics of ICT is required. A broader approach which would cover other technologies or possibly research ethics in general would be likely to overlook specific problems that arise due to the nature of ICT.

One way of addressing such problems or dilemma is through Ethics Review Procedures (ERPs) that will take into consideration the specific ethical twists involved. But the questions this research is asking are; are ethics reviews of ICT research relevant? If yes, why are they relevant?

3. Research method

An interpretive-qualitative approach was employed in this research. Data was collected through active interviews, while the analysis was done using dialectical hermeneutics [see section 4 for discussion on this]. The underlying aim of the qualitative approach was to gain an in-depth understanding of ICT researchers' perceptions of the phenomenon (which is ethics reviews of ICT research) without narrowing anything down to predetermined hypotheses that need testing to see if they are true or false as it is in the quantitative methods. In accordance with the procedure, the Ethics Review (ER) form was completed before the interviews and ethical questions of privacy, confidentiality, informed consent and data protection considered. Mechanisms for answering these ethical questions were put in place and approval was granted a total of 12 interviews were conducted with participants drawn from various UK computing departments. All the participants ranged from heads of department to senior lecturers in computing

departments/faculties in UK universities. These interviews lasted between 30 minutes and two hours and with the permission of the participants, the interviews were recorded and the data subsequently anonymized after transcription.

Each of these interviews was regarded as an important stage of the hermeneutic circle. Therefore, new issues that emerged from the initial interviews enriched the researcher's knowledge base of the research object and therefore provided information for subsequent interviews. This means that data analysis began with the first interview giving rise to a constant interplay between collection and analysis.

The active nature of the interviews helped the researcher to explore beyond the surface of superficial responses to discover in-depth meaning and values the participants assigned to a theme. Through a dialectical hermeneutic process then, the transcribed texts of the recorded interviews were analysed.

4. Dialectical hermeneutics

Hermeneutics involves the understanding and interpretation of texts (Johnson, 2008, p. 1). As a method of data analysis, it presents a way of understanding textual or oral data. It is a word that derives its roots from the Greek verb ερμηνευειν (hermeneuein), which means *to interpret* and its derivative ερμηνεια (hermeneia) meaning *interpretation (*Boland, 2002, p. 225). Hermeneutics has an etymological relationship with the name of the Greek god "Hermes", a messenger of the Olympian gods who interpreted the wishes of the immortal beings to mortal beings. Even though the history of this word goes back to the ancient Greek philosophers; Plato, Aristotle and the Stoics, it was Friedrich Daniel Ernst Schleiermacher (1768-1834), a German protestant theologian and philologist, (followed by Dilthey) who began its development as a critical and foundational evaluation of interpretation.

Dialectical hermeneutics is a form of hermeneutics whose major proponent was Heidegger who combined Hegelian dialectics and Schleiermacher's hermeneutics to construct a new philosophy of understanding and interpretation. For him, a phenomenon can be understood when existential meaning instead of a new meaning is sought through a hermeneutic dialectic. He acknowledged that interpretation cannot be attained without ones' presuppositions. Gadamer's hermeneutics was developed on these foundations. Both of them believe one's presuppositions or prejudgments are imposed on "texts" or "objects of understanding" revealing various horizons of meaning and the two enter into a dialectical movement called the "hermeneutic circle" (Myers, 1997, pp. 241-242).

This idea of hermeneutic circle emanated from the original insight of Schleiermacher (Demeterio, 2001, p. 1). For Schleiermacher, words must be examined in relation to the full sentence and the sentences in the contexts of the paragraphs and so on until understanding is reached. On the other hand, we cannot understand the individual parts without some grasp of the whole. The idea of "circle" therefore is a metaphor to explain the dynamic movement between the parts and the whole of a text or phenomenon when seeking understanding (Reeder, 1985, p. 193). It implies a back-and-forth movement between the parts and the whole which represents the art of understanding.

Therefore, a familiar (i.e. "present-at-hand") phenomenon implies that the researcher "will possess prejudice-laden pre-understanding of it (Stiver, 1996, p. 87)". In Schleiermacher's hermeneutics, this pre-understanding is generally referred to as the interpreters "prejudice" which becomes an important part of the process of

interpretation. Heidegger refers to it as "fore-structures" or "fore-knowledge" which includes *lived experiences* of the *Dasein*. Gadamer, refers to it as *pre-understandings*.

In dialectical hermeneutics, at the heart of the discussion on hermeneutic circle is the dialectic triad. This is the notion that logical arguments in a research starts from an intellectual proposition put forward by the researcher or discovered during data collection which is regarded as a *thesis*, then the discovered positions that are in complete contrast to either the researchers' proposition or some positive positions discovered during a research process called *anti-thesis* and finally the resolution of the apparent contradiction between the thesis and antithesis which is called the *synthesis*. Hermeneutic circle then means that the researcher, through a dialectic process of enquiry with the phenomena will identify the *parts* for a better understanding of the *whole*. This creates a movement of understanding from the "*whole*" to the "*parts*" and back to the *whole*. The aim is not the pursuit of the one best interpretation but rather the co-emergence of perspectives (both the thesis and the antithesis) that result from an active merging (synthesis) of boundaries by the researcher and participants. These perspectives are what Gadamer refers to as "horizons of understanding" and the merging of boundaries he conceptualizes as "fusion of horizons" (Annells, 1996, p. 706).

In this research therefore, the researcher seeks to identify the *parts* of the *whole* – relevance of ERs which will demonstrate a hermeneutic circle of understanding which also takes into consideration, the *pre-understanding* of the researcher which is; that ERs are relevant because it is an obligation every researcher ought to value.

5. Relevance of ethics reviews-some empirical findings

Reading through the interview texts line-by-line, concepts that form important *parts* of the *whole* emerged. These concepts include; duty, trust, risk-assessment, compliance, sustainability and impediment. Therefore, during the interview and analysis stage, there was a constant movement of understanding from each *part* to the idea of relevance of ER for ICT research- *the whole*. These parts demonstrate the different reasons why ICT researchers regard ERs of ICT research as relevant or not (horizons of understanding). They include:

5.1 Duty

For some of those interviewed, ethics reviews of ICT research is important because it is the moral duty of the researcher not to cause harm or indeed minimise potential negative impact of research procedures. In addition to this, it is also both a social duty and a legal obligation. Since the society through government agencies funds these university projects, it becomes a social responsibility of the ICT researcher not to carry out research that can harm the society at large. Ethically reviewing research projects therefore is part of carrying out this duty. An example of the responses that highlight the concept of duty is; […] *as a means of minimizing harm, it (*ethics reviews*) is a legal obligation and part of the social responsibility of the researcher*. Understood within the concept of duty ethics, this shows; that ICT researchers have duties to oneself and also to others; that it is the duty of the researcher not to go against ones natural, universal and inalienable rights such as the right to privacy; that ethically reviewing ICT research is the duty of the researcher not because he is considering the consequences but because it is good in itself and that ICT researchers should see ER as a prima facie duty.

5.2 Trust

This was another concept that emerged from the interviews conducted. Ethically reviewing ICT research is taken as a key factor in building trust between the developer and users, and between the researcher and funding bodies. It is very important in the success or failure of ICT artefacts. By establishing effective ethical procedures to review ICT projects, the developer or researcher sends out a positive message to the user that he/she is doing everything morally right in producing the artefacts. A user's knowledge that the ICT researcher is allowed to freely produce any artefact he/she chooses without being subjected to any ethical review can breed mistrust. Given obvious cases in medical sciences, this can be a valid reason to worry.

The participants believe that teaching students the necessity of ERPs can help make their future products successful. Even though establishing the relationship between ERP and product success/failure is not within the limits of this work. However, Rogerson and Gotterbarn (1998, pp. 278-296) believe that there is a relationship and this result suggests that ethics reviews can be part of the solution. In ICT development and usage, the issue of trust has piqued interest among researchers in recent times (Vance *et al.*, 2008, pp. 70-100). As some scholars have pointed out, trust should be at the heart of the design of ICT products because the failure to enhance trust may result in suspicion and eventual rejection of new technology (Clarke, 2008, p. 1).

5.3 Risk assessment

For some other participants, ethics reviews of ICT research are relevant because it is or should be an important part of risk assessment. Every research procedure or investigation has an element of risk. Conducting a piece of research means that results are unknown to the researcher as well as their potential risks. This element of uncertainty makes a strong case for the careful assessment of the research process and objectives to identify potential and immediate hazards to the researcher, the participants and also potential users. For these participants, ethics review is one channel of doing this. While acknowledging the fact that there are evident relationships between the concept of ethics and risk-assessment, this researcher notes that risk-assessment is part of fulfilling ethical standards and not vice versa. Ethics is wider than risk-assessment and is based on the ethical principles of beneficence and non-maleficence; doing good and avoiding harm.

5.4 Compliance

Closely related to risk-assessment, this concept is used here to group participants' views that indicate that ethics reviews are relevant only because it helps the researcher to be compliant with funding and legal requirements which ultimately helps to avoid litigation. An example of such responses is […] *with available legal frameworks on how research is done, people have started thinking about it in terms of avoiding litigation and fulfilment of requirements.* These views point to two forms of consequentialism: rule consequentialism and act consequentialism. Rule-consequentialism holds that an action is right if it is in accordance with a certain code of rules (Portmore, 2009, pp. 368-376). This means that an act is morally permissible if and only if it is allowed by a set of rules, which if complied with, would produce the most good.

On the other hand, act consequentialism holds that the rightness of an action depends on if it produces a better consequence than alternative actions available to the agent

(Bunnin and Yu, 2008, p. 9). An act is morally permissible if the compliance to a set of rules by the majority would produce the most good. Generally speaking then, both forms agree that the rightness of an action is determined by its consequences. However, while rule-consequentialism does that indirectly, act consequentialism is forthright with it.

For those who believe that the establishment of ERPs is only important because it is an adherence to regulations or guidance, they are expressing a form of rule-consequentialism. The participants who feel that complying with the regulations in the form of ERP helps in the avoidance of litigation are act consequentialists. Both views were popular with the participants and as such can be indication of the generally held opinion among computer scientists in UK computing departments who believe in the relevance of ERPs.

5.5 Sustainability

Sustainability is another concept that emerged from the interviews. Even though this concept is not commonly discussed in ICT, the results showed that ethically reviewing ICT research will play an important part in ensuring environmental sustainability. For these participants, it will minimize the potential or current negative impact of ICT on the environment. Presently, there is no solid evidence of the relationship between ICT and environmental sustainability. However, there are some scholars who believe there are "signs that ICTs can have an important impact on environmental sustainability" (Erdmann *et al.*, 2004, p. 17). They point to individual case studies on the impact of ICT on aspects of sustainability such as electricity consumption but acknowledge that there is no coherent research on the full range of impacts.

This means that even though there is a great deal of uncertainty on the relationship between ICT and sustainability, there are identified areas where the development of ICT could have a significant impact. Therefore, sustainability should be a legitimate concern for ICT researchers. Identifying sustainability as a reason for ERs of ICT research finds some basis on the ethical principles of beneficence, justice and respect for persons.

5.6 Impediment

The term impediment means obstruction, obstacle or hindrance. The researcher is using this word to refer to views pointing to this meaning which were raised by the participants. A couple of the participants raised it in different ways during the interview. For them, ERPs are not relevant at all; rather they are impediments to good research. It does nothing but hinder the progress of relevant research developments. Therefore, its establishment is unnecessary and irrelevant. However, there was some hesitancy when specific and different situations from what they seem to know were put to them. These answers reveal that if the procedures are made less bureaucratic and cumbersome, these participants would understand its relevance. Their understanding of ERPs as irrelevant is partly influenced by their lack of knowledge of what is ethics/ethics reviews and also their dissatisfaction with existing procedures currently perceived as ineffective and involves unnecessary delays.

This concept provides an important anti-thesis to the logic contained in the collated data. On the one hand there are participants, who believe that ERs are relevant in ICT research because of such reasons as duty, compliance, sustainability and risk-assessment. In opposition to these views, here is a position that asserts that ERs obstruct and hinder valid research and, therefore, are irrelevant. Their rejection of ERs

can be explained by the lack of clear understanding of what it means or of what it entails which has not been helped by difficult procedures. That means that if they acquire more knowledge of ERs or if procedures are made easier and clearer, their position might be different. Figure 1 shows clearly the back and forth movement between the whole (relevance) and the parts (the different concepts that emerged).

6. Revealed hermeneutic dialectic

With a pre-judgement that ERPs ought to be an obligation for a researcher, the above views reveal various horizons of understandings new to the researcher. While this pre-judgement finds meaning in the concept of duty, the other views on trust, risk-assessment, compliance, sustainability and impediment provide different horizons of understanding on ERs. These horizons of understanding emerged through a hermeneutic circle. In this hermeneutic circle, the thesis (duty, risk assessment, compliance, sustainability) and the anti-thesis (impediment) can be synthesised in the following statements. Generally and technically

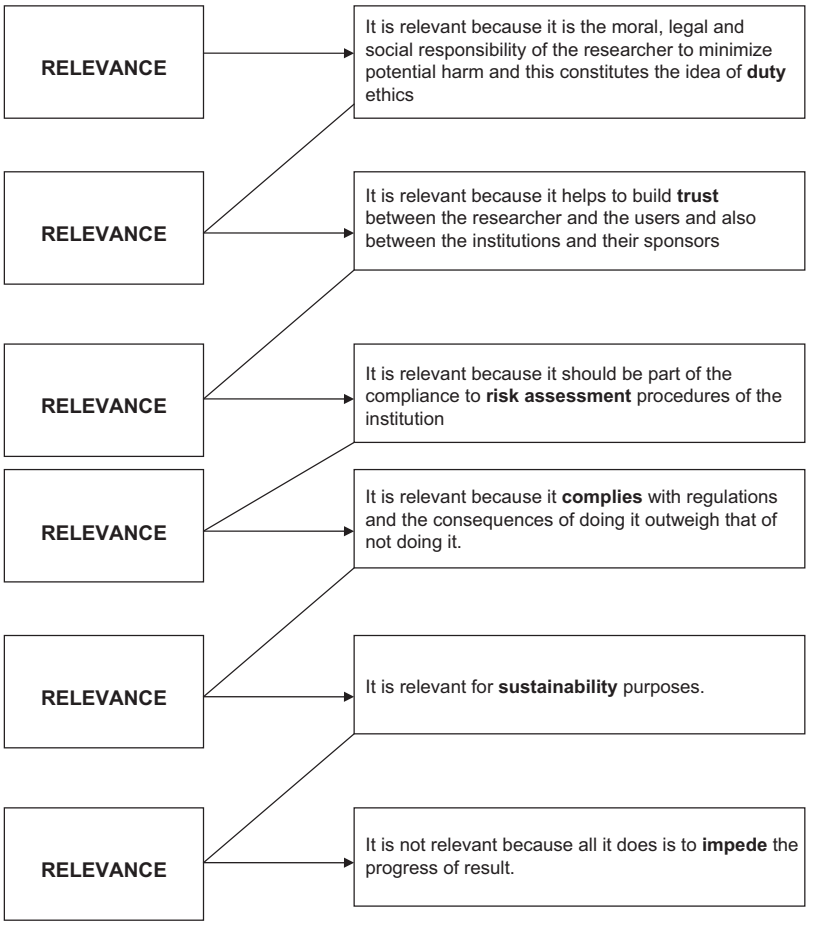

Figure 1.
Identified horizons of understanding on relevance of ERs of ICT research in UK universities

speaking, ethics reviews of ICT research are relevant but the existing lack of knowledge of what ethics is and cumbersome ERPs for ICT researches in UK universities impede the progress of valid research, therefore the procedure can become more relevant if the procedures are made clearer, easier and faster and ICT researchers receive adequate and sufficient knowledge and understanding of what it means [see Table I]. The hesitancy noticed with the participants who believe that ERs are not relevant indicates that with adequate education of what ethics is and the improvement of the present procedures, more people including these participants will appreciate ERPs in ICT research more.

7. Conclusion

This paper has presented the results of a research that focussed on understanding the relevance of ethics reviews of ICT research for ICT researchers in UK universities using a dialectical hermeneutic process. It revealed the different concepts that demonstrate the participants' reasons for the acceptance or rejection of ethics reviews as relevant. The main contribution of these results is that they provide insights into the different understandings of relevance attached to ethics reviews of ICT research which can assist policy makers in both regulatory bodies and in the UK universities to develop ethics

Researcher's pre-judgement	Participants' views		
	Thesis	Anti-thesis	Synthesis
ER of ICT research is relevant because it is an obligation of the researcher not to cause harm and ERs help him to do that	ER of ICT research is relevant because it is a researcher's duty, it breeds trust, it is part of risk-assessment, it is compliance to regulations and it improves environmental sustainability	It is not relevant because it impedes the progress of research through its difficult procedures and nothing we do raises ethical problems	Ethics reviews of ICT research projects are considered relevant but owing to lack of knowledge of what ethics is and cumbersome ethics review procedures for ICT researches in UK universities, the progress of valid research can be impeded, therefore the procedure can become more relevant if the procedures are made clearer, easier and faster and ICT researchers receive adequate and sufficient knowledge and understanding of what it means

Table I.
Emerged hermeneutic dialectic on relevance of ERs in UK computing departments

Note: What this table shows is that in the face of the different horizons or views of understanding of the participants, the researchers pre-understanding breaks down; a fusion of horizons occurs and thus he transcends to a more informed perspective which is represented as the synthesis or what Gadamer referred to as *verstehen*

review frameworks specific to ICT which is presently lacking; a framework that can be made more effective if ICT researchers can appreciate better the relevance of ethics reviews through proper education on ethical issues.

While the research does not lend itself to develop full-blown policy recommendations, it does point in the direction in which policies will need to take. One important starting point is that there are numerous reasons why ICT researchers are in favour of ethically reviewing their work or at least not opposed to it. This is a good starting point for policies and policy makers including the government.

At the same time the research has shown clearly that there are several obstacles to be overcome in order for ICT researchers to accept the necessity and practice of ethics review. This means that there is a need for a deeper education in ethical issues for ICT researchers, which is likely to require changes to the curriculum. In addition, ICT researchers should recognize that dealing with ethics is not an obstacle. They need to see that it is in their own interest to consider broader context. In addition they need to experience that engaging with ethics does not have to be a time-consuming and bureaucratic endeavour.

These recommendations point to further research. The present study was undertaken on a relatively small sample and cannot claim to be representative. To justify larger scale policy changes, the basis of the inquiry would have to be broadened to cover the different sub-disciplines of the ICT portfolio in more depth. While statistical representativeness is not possible and not even desirable for the approach chosen here, it may be an aim in follow-up studies.

A final question arising from the research presented here is whether and to what degree the currently dominant model of ethics review that is based on biomedical ethics is optimal for ICT. ICT research and biomedical research differ in some fundamental regards. While there is a reasonable assumption that medical research will benefit not just society but also in most cases the individual participant, neither the social nor the individual benefit is obvious in ICT research. This raises larger questions about the possibility of ethically evaluating the consequences of ICT research. It is not clear whether this can best be done using ethics reviews or whether the ICT community would be better off using different tools from the currently developing repertoire of responsible research and innovation.

While these questions are currently unanswered, the present research indicates that they are worth answering and that the ICT research community can be persuaded to engage in the process of answering them.

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