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Improving skill development: an exploratory study comparing a philosophical and an applied ethical analysis technique

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Improving skill development: an exploratory study comparing a philosophical and an applied ethical analysis technique

This exploratory study compares and contrasts two types of critical thinking techniques; one is a philosophical and the other an applied ethical analysis technique. The two techniques analyse an ethically challenging situation involving ICT that a recent media article raised to demonstrate their ability to develop the ethical analysis skills of ICT students and professionals. In particular the skill development focused on includes: being able to recognise ethical challenges and formulate coherent responses; distancing oneself from subjective judgements; developing ethical literacy; identifying stakeholders; and communicating ethical decisions made, to name a few.

Keywords: case study, code of ethics, critical thinking, ethical theories, logic, philosophy.

Introduction

In recent years there have been several disillusioning experiences in relation to information and communications technology (ICT) ethics education. A recent book by Weckert and Lucas (2012), which presents various findings from an Australian national survey of the industry, found that ICT graduates were more likely to engage in unethical practices, than people working in ICT who had not graduated from a tertiary ICT course. This suggests that although all universities in Australia teach ICT ethics, there is a mismatch between what is taught and what is learnt. Similarly in research involving ICT graduates who had been working at least 18 months, it was discovered that although all of the participants had experienced ethical problems in the workplace, little of what they had been taught at university had prepared them for what they confronted (Burmeister & Sharma, 2005). Thus it behoves educators to consider how ICT ethics is being taught and what more can be accomplished to improve the outcomes for graduates, that is, outcomes that help them to engage professionally in ethical situations

that arise in the workplace.

Case studies have frequently been employed to illustrate ethical principles and particularly conflicts and prioritisations amongst those principles (Burmeister and Weckert, 2003; Ferguson et al., 2005). For instance, Anderson et al. (1993) employed scenarios to explore the application of a new code of ethics in different professional settings. Why explore scenarios? Why not just wait until one is confronted with an ethical problem in the workplace and then apply ethical analysis? An advantage of using scenarios is the ability to explore situations ahead of time, in order to distance oneself from the subjective nature of the discussion. That is, one skill that professionals need to acquire is the ability to take an objective view of a situation, even though they are involved in it. Educators suggest that one way to achieve this is for students to be taught using a range of case studies that reflect industry practice, such that if they are confronted with a related situation, they are better equipped to respond appropriately (Gotterbarn and Miller, 2009; Plummer et al., 2011).

This article begins with a review of the literature, in order to place the two techniques that are detailed thereafter, in the context of ICT ethics teaching. Those two techniques for engaging students in systematic ethical thinking are illustrated using a case study that recently caught media attention around the world. The article concludes by comparing and contrasting the two techniques, thus illustrating their ability to develop ethical analysis skills.

Previous Research

This review first discusses the need for effective ethics teaching, highlighting its importance in preparing ICT professionals for the ethical challenges that they will face in the future and introducing the two main categories of ethical analysis that this study explores. Next, the review looks at the challenges in front of the students that could

make the realisation of the goals of ethics education difficult. Finally, it discusses the skills that an ethics subject¹ should foster and the widely used strategies to teach ethics focussing on the learning outcomes that should be set for students.

The need for effective ethics teaching

There is no evidence in the ICT ethics literature that suggests that completing an ethics subject will have a positive impact on student's behaviour in the workplace. The results of one study indicated that while completing an ethics subject may have had some impact on students by making them more aware, their behaviour did not change significantly (Thomas & Ahyick, 2010). Another study, however, suggested that ethics teaching, specifically using role play with cases, was effective in developing the ability to recognise ethical issues, enhancing the understanding of the nature of the ethics landscape, and that there are multiple legitimate positions to any ethical debate (Johnson, 2010).

Ethics teaching, whether it is for information systems students, computer science students, computer security professionals, or even high school students, is undoubtedly needed (Towell et al., 2004; Johnson, 2010; Fleischmann, 2010; Lee, 2010; Nikos et al., 2010). Given the increase in the reliance of government, commerce, business, and society in general on ICT (Fleischmann, 2010), it is important that scientists, information technology professionals, and computer security professionals are adequately prepared for the ethical challenges that they will face in their working lives (Towell et al., 2004; Johnson, 2010; Fleischmann; Thomas & Ahyick, 2010). The goals of ethics teaching include encouraging ethical decision making (Lee, 2010), helping with preventing cases of misconduct (Johnson, 2010) and ensuring that the public trust

¹ Equivalent to course in the American system.

in the integrity of ICT is not undermined by unethical practices (Gotterbarn & Miller, 2009; Johnson, 2010).

Two main categories of ethical analysis emerged in the literature. One is a philosophical approach that utilises philosophical formulations and philosophical logic; the use of multi-disciplinary approaches to teaching ethics, with a particular focus on philosophy has been widely advocated (Huff, Barnard, & Frey, 2008; Martin, 1999; Burmeister and Weckert, 2003; McDermid, 2008b). The other is an applied ethics approach that uses a variation of question and answer approach to systematising the ethical analysis; such approaches are used widely in teaching business ethics (Plummer, 2011), as well as in various areas of ICT (Gotterbarn, 1999).

Student challenges

In accepting that the attainment of ethics teaching goals are important, a question arises: *what are the challenges in front of the students that could make the realisation of the goals of ethics education difficult?* Students who take ethics subjects face several challenges. As with other philosophy subjects, ethics subjects have requisite skills including how to write essays, think critically and how to engage with the literature (Johnson, 2010). But, as Johnson (2010) noted, science students, which is also true for information technology students given they share a similar background, don't have these skills as they are not accustomed to writing essays, formulating arguments and consulting the literature as part of their studies. This skill deficit among the science and information technology students may limit their chances of performing well in ethics subjects or reduce their benefit from those subjects. The literature also revealed that the above difficulties may make science students, possibly true also for information technology students, develop a negative orientation towards ethics subjects (particularly those who lack real world experience). The difference in the culture and expectations

between the humanities and sciences may make students perceive ethics subjects as either challenging, inferior to their chosen programs, irrelevant, or common sense (Johnson, 2010). In the face of these evidences, it is probably safe to assume that these difficulties will contribute to poor learning outcomes for ICT ethics students.

Skill development, teaching strategies and learning outcomes

To address the above skill deficit among ICT students, scholars argued that the most important skill that an ethics subject should foster, was the ability to recognise ethical problems (Johnson, 2010; Thomas & Ahyick, 2010; Fleischmann 2010; Lee, 2010) and formulate coherent responses to them (Johnson, 2010; Thomas & Ahyick, 2010).

Literacy, criticism, analysis and argument construction were also important skills, according to Johnson (2010), that students taking ethics subjects need to be able to evaluate ethical situations. Johnson (2010) argued that critical thinking was another essential skill that should be built during the teaching of ethics subjects so students are able to apply taught principles to real life situations. This view was also supported by Towell et al. (2004) who pointed attention to two additional skills namely the communication and rhetoric skills. Various additional skills have been suggested in the literature as needing to be taught. These include the skill of identifying stakeholders, the skill of applying codes of ethics to scenarios, and the skill of identifying and evaluating possible courses of action (Martin and Wertz, 1998).

The most widely used strategy to teach ethics, involved the use of case studies (Fleischmann, 2010; Maslin et al., 2010; Lee, 2010; Thomas & Ahyick, 2010).

According to Towell et al. (2004), the top methods involved the use of case studies (56.3%) and discussion of personal experiences (54%) of the instructor, colleagues, or students. Another popular teaching strategy discussed in the literature was the use of role play (Towell et al, 2004; Johnson, 2010; Fleischmann, 2010; Lee, 2010). Johnson

(2010) argued that using role play with case studies was not only effective in developing the ability to recognise ethical issues but the enjoyment in role-play could address the negative attitudes that students may have towards ethics subjects (Johnson, 2010).

Another question arises: *what learning outcomes should be set for the students taking ethics subjects?* Although there is no consensus, educators tend to focus on teaching skills and providing the resources required to help students engage in solving ethical problems (Johnson, 2010). Johnson (2010) argued that the outcome of learning should be one that will help students recognize moral issues or develop, what he calls the “ethical radar”; and appreciate the nature of ethics, or, in other words, the points of difference between people on ethical issues.

Study approach

We proceeded as follows: first we selected a recent media article that raised an ICT ethical issue (see BBC (2010) for the case study). Next the authors chose two techniques that had been widely used with ICT professionals and tertiary students, and which the authors had taught. One was a philosophical ethics approach (Rationale) and the other an applied ethics approach (the Doing Ethics Technique (DET)). Rationale was also selected because it is a critical thinking software that has been adopted by several universities in Australia. Unlike the DET, Rationale is not just limited to ICT ethics teaching; it is also used in English, social studies, history and philosophy. Another justification for using the DET is that it is the only technique in McDermid (2008b) textbook which is widely used in Australia at both the University and vocational training levels.

Third, the first author constructed a diagram using Rationale (see next section

for an overview of this method) to depict the map of the argument about the same moral issue that the selected media article appears to be raising presenting the supporting reasons and objections to the reasons in order to create a balanced argument. Then he converted the diagram into a textual form adhering closely to the map of the argument and applied the two philosophical formulations, namely Mills harm principle and Kant's 'means to an end' categorical imperative, to the same ethical issue to show how these philosophical formulations can be used to arrive at moral judgments about the ethical issue.

Concurrently, the second author analysed the case study, as reported in the article, using the DET addressing each of the eight technique questions and looking at the situation also from the point of view of the ICT professional using the British and Australian computer societies Codes of Ethics, and that of the American Association for Computing Machinery and two philosophical formulations.

Finally, we drew conclusions that brought all the analyses together offering overall comparisons in relation to how the techniques, namely Rationale and the DET, can be used to facilitate development of skills such as critical thinking, about an ethical issue, and ethical decisions making.

Philosophical approach

The analysis of the case study using Rationale and philosophical formulations

Rationale is a philosophy-based method of representing ethical problems and working towards logical arguments. It is one of the methods that has proved to be useful and effective in representing ethical arguments graphically (that is, using diagrams) (Twardy, 2004). Anecdotal evidence from past and current students who took the Topics in IT Ethics subject have found it useful in engaging them in critical thinking,

participating in discussions, formulating well-reasoned arguments and writing clear and concise essays (as long as the diagram is developed before the essay is written). The software, which is a package from a company called Austhink Software, helps students to build a model of their argument, allowing them to clearly see the logical structure. Students can then use the developed argument as the basis for constructing critical discussions about the moral judgment of ethical problems in the form of an essay.

In Rationale, an argument is like an upside down tree with the root being the main conclusion. It is made of arguments that have a relationship among them which forms the reasoning. Each argument is a claim with a single reason for it or an objection to it. Each reason or an objection is made up of one or more claims that help each other or work hand-in-hand in providing the reasoning to the claim above them. The main conclusion starts the argument and it has to be evaluated to either true or false. To be true or false the conclusion has to be a full, grammatical, declarative sentence; it should also be normative, that is, make an evaluative judgment in the form of what ought to be the case as opposed to what is the case which is descriptive, and in the context of ICT ethics it should also be moral, that is, making a judgment about the rightness or wrongness of the action in question. Reasons should directly address the idea in the claim above them, that is, they should answer 'why' or serve as 'because' for the claim above them (Austhink, 2012).

Reasons, or objections for that matter, should observe three rules: the Golden Rule, the Rabbit Rule and the Holding Hands Rule. The Golden Rule states that every argument has at least two supporting premises and this is to ensure even the obvious or hidden supporting premises are explicated. The Rabbit Rule states that any important term or concept that appears in the conclusion must also appear in one of the premises and this is to make sure that the conclusion is appropriately tied to the premises. The

Holding Hands Rule states that if something appears in a premise but not in the conclusion, it must appear in another premise to make sure that the premises are tied to each other (see this link <http://rationale.austhink.com/learn> for a complete guide on Rationale).

Philosophical analysis of the case using Rationale

The argument, in textual format, was developed based on the Rationale argument in Appendix 1 and proceeds as follows²:

It is wrong for Google to collect data from unsecured wi-fi networks³. There are three reasons for this: collecting data from unsecured wi-fi networks was done without the wi-fi user's consent, violated users' privacy and exposed their data to abuse.

However, there are also three objections to this line of reasoning. Google collection of the wi-fi users' data, according to Google, was unintentional, was a mistake and did not require consent in the first place.

Google collection of users' data from unsecured wi-fi networks was wrong because it was done without obtaining the wi-fi user's consent. Indeed, not seeking the permission of users before they collected their data was unethical because by doing that they violated the wi-fi users' basic human rights. Their rights to have control over the

² It is important to note that this argument draws its information from the points made in the BBC (2010) media article. The argument is presented here to show how easy it is to convert an argument represented graphically using Rationale into a clear and concise essay. It is beyond the scope of this article to question the points made in the media article i.e. BBC (2010). It is also beyond the scope of this article to verify the substance of the argument presented here or offer a fully fleshed one.

³ This is the main conclusion of the argument.

flow of their own information, to be consulted in matters pertaining to them (consent), to be autonomous agents, to be free (right to liberty), to feel secure and to be treated with respect have all been violated. The violation of these human rights is undoubtedly wrong. However, it can be argued that the Google collection of users' data from unsecured wi-fi networks was merely accidental overhearing and accidental overhearing does not require users' consent. Still, data collected was written to hard drives. If it was merely a case of accidental overhearing, data would not have been recorded in the first place. Intercepting users' data and then storing it into hard drives suggests it is not accidental and it is not overhearing.

In addition, collecting data from unsecured wi-fi networks may breach the wi-fi users' right to secrecy (or their right to control information about them), to solitude (freedom from surveillance and observation), and most importantly to anonymity (freedom from the attention of others). Given these interrelated elements define privacy (according to Gibbs, 2008), breaching the wi-fi user's secrecy, solitude and anonymity is then clearly a violation of their privacy which is unethical (Tavani, 2012). Similarly, collecting data from unsecured wi-fi networks could expose data to abuse by malicious users which in turn could result in serious harm to individuals. For example, malicious users can use the collected data to assume the identity of an individual or stalk them or even steal their money. That is why subjecting individuals to harm is considered wrong by all rational beings.

Conversely, Google collection of users' data from unsecured wi-fi networks was not wrong because it was not intentional. That is, the absence of intent makes the action unobjectionable. However, Google did differentiate between encrypted and unencrypted content. Differentiating between encrypted and unencrypted content shows intent, which contradicts what Google said. But, collection of users' data from unsecured wi-fi

networks, according to Google, was a mistake; so it should not be deemed ethically wrong. Still, the Google claim that it was a mistake does not add up. Google's project appears to be a complex one. It must have been given a budget and so according to Google, all their budgeted projects require management oversight suggesting this was not a mistake. There is also another argument against accusing Google of wrongness with regards to collecting users' data from unsecured wi-fi networks. Because the data were not protected by the users, consent was not required to collect them. If users were concerned about their privacy they could have secured their wireless networks. It is not Google's fault that some wireless networks are not protected. But the fact that the wireless network is not protected does not give anyone the right to intercept the traffic let alone collect data from it.

In analysing this case study using philosophical formulations, specifically Mill's harm principle (Mill 1975), it would appear that collecting data from unsecured wi-fi networks was wrong because it can harm users, violate their basic human rights and invade their privacy. As mentioned above, malicious users can use their data to assume the identity of individuals or stalk them or even steal their money. Putting restrictions, possibly in the form of laws and regulations, on collecting data from unsecured wi-fi networks can help stop harm from being inflicted upon those users. This also shows that while collecting data from unsecured wi-fi networks can be used to cause harm to users or invade their privacy or violate their basic human rights, protecting their privacy can protect individuals from these kinds of harms and violations.

Using Kant's 'means to an end' categorical imperative, it would appear collecting data from unsecured wi-fi networks was wrong because Google used users as means to an end only (the means being the users themselves and the end being their private data to store in Google's giant knowledge repository about the world). Respect

for persons entails that people should be treated as ends in themselves, and not only as means to some end. To treat users with respect means they should be treated as persons who have value in themselves, and not just as pieces of information that could be acquired to increase the size of Google's knowledge repository and enhance Google's intimate knowledge about the world. Users of wireless networks should exercise caution when accessing the internet by ensuring their networks are secure and protected by passwords.

Skills taught using the philosophic approach

A feature of this approach appeared to be its focus on philosophic logic and argument mapping, as a result of which the skill of *argument construction* can be taught and reinforced. Given its focus on philosophical theories, another skill arising from it is *ethical literacy development*, depending on which philosophical theories are taught as part of the analysis. Students are also taught *written communication* skills, in that the argument map has to be converted into prose, in the form of an essay structure. In addition this approach encourages the *ability to distance oneself from subjective judgements* because it focuses not only on stating the reasons for each claim but also on the objections to it. Alternatively, there is no attempt at *stakeholder identification* with this approach, except incidentally when the person applying the technique thinks to include this. However, as seen in the literature review above, it has been argued that students need to develop the skill of *appreciating that the nature of ethical debates is that there are points of difference between people on ethical issues* (Johnson, 2010).

Applied approach

The passive and active forms of the Doing Ethics Technique

The passive form of the DET is what is taught in Topics in IT Ethics subject, as well as in undergraduate ethics teaching at Charles Sturt University. The technique has also been widely taught in Australia (Burmeister, 2008; McDermid, 2008a; Simpson et al., 2003). It is passive, in that it is a systematic way for an individual to work through an ethical problem. The active form has also been effectively taught to the Topics in IT Ethics students, and others (Simpson et al., 2003). However, the active form requires the participation of multiple people, with individuals or groups taking the perspective of one stakeholder group. That is, the skill of *stakeholder identification* is an integral aspect of the active form of the DET. The active form tends to result in a richer set of variables and better ethical solutions, because it takes into account the multiple and often competing viewpoints of different stakeholders. Furthermore, following the arguments above by Johnson (2010), it is a better form of case study analysis because it can involve role-play and thus dramatic enactments, in which differing stakeholder groups can argue in favour of their position, or against the positions taken by other stakeholders. Thus it can also be good at developing *communication* skills, both verbal and written. Consensus is not the aim, but rather, understanding and valuing each others' differences. Thus the active form of the DET is useful in workshops and face-to-face tutorials, and results in solutions that are qualified. That is, the solutions can articulate how certain options favour one or another stakeholder group, and thus unlike the passive form of the technique, a greater breadth and richness is reflected in the final solution. In workshops with ICT professionals, as well as in large university tutorial groups with students, the active form of the DET has proven very effective. However, for distance students, for small class sizes and for individuals working through an ethical challenge, engaging in the type of facilitated group work that the active form of the DET requires, can be difficult.

Figure 1: The passive form of the Doing Ethics Technique

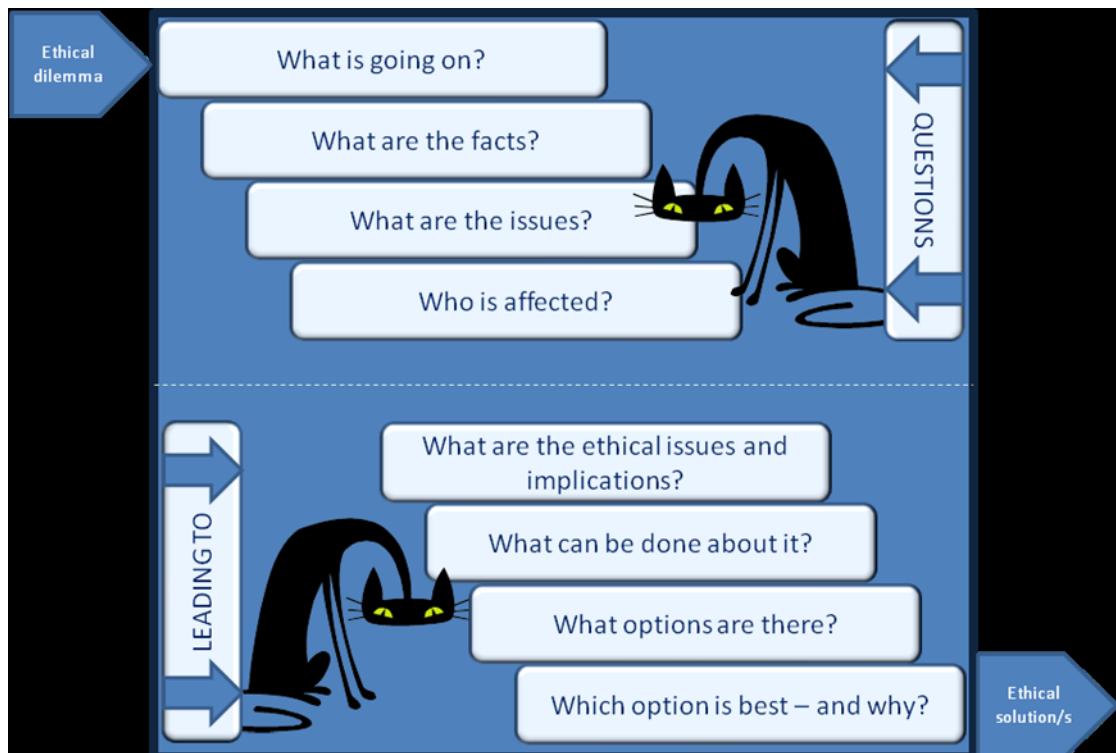


Figure 1, which appeared first in Seach, Cattaneo and Burmeister (2012) and represents Schrödinger's cat⁴, suggests the outcome from an ethical problem only becomes clear once you look inside the box and start to examine the problem. The DET describes a systematic process that avoids solving an ethical problem on the basis of emotions. Thus the box represents a system with standard inputs and outputs. However, the DET does not include a measure of efficacy.

From a practical perspective, the DET is a series of eight questions that can be applied to a case study, in order to facilitate the development of recommendations that can solve the problem in question. As illustrated in Figure 1, these questions can be divided into two groups; the first four and the last four. The first four not only establish

⁴ Schrödinger's cat is a famous 1935 quantum mechanics thought experiment about possible outcomes involving a cat placed inside a box.

the facts and the issues, but also serve to provide the user of the technique with a wider perspective. That is, the skill of distancing oneself from an emotive, subjective response is part of the systematic approach of this technique. The last four questions focus more on the ethical behavior of the ICT professional. An explanation of the DET questions and how they apply to the ethical issue in question are discussed below.

The analysis using the Doing Ethics Technique

Q1. WHAT'S GOING ON?

This is a synopsis of what the case is all about. It can be taken from a variety of perspectives, for example, from the perspective of a person raising a complaint, in which case, it is a synopsis of the complaint. It can be taken from the perspective of an involved observer, in which case, it is an outline of what was observed, without going into too much detail. Where there are multiple perspectives, those should be described here.

For this case, responses to Q1 might be that as Google collected StreetView data they also collected all unencrypted wireless communications data that they were able to access. Furthermore, the communications data collected in this manner breached privacy legislation in at least 30 countries. Moreover, as reported in the BBC (2010) media article, multiple jurisdictions were pursuing legal avenues against Google for privacy violations on the basis of claims of intent. Another response could be that Google denied intent, claiming that it was accidental. Thus whereas Rationale begins by stating the main conclusion and then breaks down that choice, in a top-down fashion, the DET is a bottom-up approach.

Q2. WHAT ARE THE FACTS?

This is a descriptive list of the facts of the case. This doesn't just describe the case; it lists the facts as they are known (from all sources and perspectives), and also what one might

reasonably consider to be possibilities. For example, if a person was raising a complaint, Q1 would outline their complaint, and Q2 would provide the evidence to both support and refute that argument. All such facts must be demonstrable or supportable. It would be worthwhile to assign a credibility weighting to each fact, to help with later analysis.

The facts of this case include: Google collected unencrypted wireless communications data in a manner that breached privacy legislation. It was alleged that Google acted with intent although Google denied intent, claiming that it was accidental. Google claimed it was the work of a lone engineer and that all their projects undergo rigorous checking. However, the code involved was complex and not likely the work of a sole individual. The complexity of the work involved would have required an allocated budget and management oversight. Users of the communications did not give consent for Google to copy their interaction. Google did not seek user permission. They recorded all the communications data and did not make it available to authorities when requested to do so. Google also differentiated between encrypted and unencrypted data, suggesting intent.

Q3. WHAT ARE THE ISSUES?

This is a list of ALL the issues that are involved in the case, whether they be ethical, legal, or otherwise. Q5 seeks to extract only the ethical issues for further analysis, but at this stage the focus is on simply extracting and describing every relevant issue.

In this case the issues are: Google collected unencrypted wireless communications data without the permission of those involved in those communications. Collecting data without permission of users breaches privacy. Google appeared to act with intent and the work may not be of a lone engineer unless their rigorous project checking is not so rigorous after all. Google's intent is seen in its differentiation between encrypted and unencrypted data. Google recorded all the

communications data and has not made it available to authorities when requested to do so.

Q4. WHO IS AFFECTED?

This is a list of all the stakeholders involved in the case. This need not be restricted to the ones specifically mentioned in the case. It is necessary to consider who/what else might be affected by the issues listed at Q3, regardless of the degree to which they are affected. Q4 involves a description of how each stakeholder is affected, both positively and negatively. It may also involve comments on the degree of effect.

Those affected in this case are as follows: Google and its shareholders; the users whose communications were intercepted by Google; the engineer whom Google claimed was responsible for the code; the Google team who were responsible to conduct rigorous project checking; Google management who oversaw the StreetView project; and the authorities who requested Google to provide copies of the communications data. In addition, the legal authorities who were prosecuting Google in their respective jurisdictions; users of Google worldwide, who place their trust in Google to abide by their stated privacy policies; the marketing companies and other organisations who are potential consumers of the communications data captured by Google and the line managers within Google who approved budgetary expenditures for the communications data capture coding.

This concludes the first bracket of questions depicted in Figure 1. From here this technique focuses more specifically on ethical, as opposed to general, analysis.

Q5. WHAT ARE THE ETHICAL ISSUES AND IMPLICATIONS?

For this question extract only the ethical issues identified at Q3. List the ethical issues, discuss them in terms of classical ethical theory, and discuss their implications – on the stakeholders, as well as on the ICT and wider community. Professional codes of conduct

should also be considered in this evaluation of the issues and implications.

In this case responses to Q5 could include: collecting data without permission of users breaches privacy; Google failed in its duty of care; and Google denied intent, claiming that it was accidental but lack of intent does not make the storing of that data acceptable. Also, just because some wireless communication was unprotected/unencrypted does not give Google or others the right to intercept and store it.

Kantian ethics suggests that intent or motivation is an important consideration. If the legal action proves that Google acted with intent, then their actions as a corporation, and the actions of the management, line managers and the engineer involved were not ethical. Consequentialism suggests that this was unethical behaviour, because the consequences of these actions resulted in the loss of reputation for Google, a breach of the public trust, the victimisation of innocent users of unencrypted communications and the breaching of privacy legislation in at least 30 jurisdictions.

Codes of professional behaviour vary from one country to another, and given that at least 30 jurisdictions are involved, no single code can address the issues in this case. However, many ICT codes have common elements, including the need to uphold the public good, to show a duty of care, to obtain informed consent, and to be honest in interactions. For example, the codes of the British and Australian computer societies, and that of the American Association for Computing Machinery all hold that the public good must be a major consideration, when considering ethical issues, and therefore in this case study, the effect of Google's actions on public trust are an important ethical and professional consideration.

Q6. WHAT CAN BE DONE ABOUT IT?

This question elicits a general idea of what can be done to resolve the case, whether

those ideas are practical, possible, or not. Generally what kind of resolutions might there be? The answers need not go into great detail, as its purpose is to provide a basis for answering Q7, but they do need to broadly and laterally to come up with several alternatives.

Possible responses for this case might be: Google issues a public apology; Google releases copies of the data gathered to authorities, so that they can assess for themselves that there was no intent; and destroy the communications data gathered. In addition, Google should not sell the communications data to third parties; review budgeting and management oversight of projects, to ensure such accidents do not occur again; reprimand the engineer responsible and make the StreetView application available for public scrutiny prior to the next round of data gathering for that project.

Q7. WHAT ARE THE OPTIONS?

This question requires detailed listing and description of all the possible options that might be available to resolve the case. Be creative here; the most obvious options are not always the best. It's possible that not all options will result in a positive outcome for all stakeholders. List and describe at least three different options, and discuss the benefits and detriments of each. Three options arising in this case might include the following.

Option 1: Review of systemic processes for Google's project management. This does not solve the current problem, but will help to improve project management, budgetary/fiscal project oversight, and overall management oversight of projects. It ensures that the likelihood of a repeated breach of ethics is not likely to occur. Training in ethical processes, such as integrity systems development, should be a part of this process.

Option 2: Focus on re-establishing public trust. Many codes of professional conduct make 'the public good' their primary focus (true of the British, Australian and

American codes mentioned above). The breach of public trust evidenced in this case necessitates action on the part of Google and the ICT industry to re-establish trust. This solution encourages the involvement of Google with multiple ICT societies, best accomplished through the involvement of the international umbrella ICT body, the International Federation of Information Processing, which has over 50 member ICT societies, including the three mentioned above.

Option 3: Proving that no intent was involved. Make the data available to authorities who have requested it, but in such a way that once examined, all that data will be destroyed. Next, destroy all records of the communication data. Finally, as part of this alternative, Google should issue a public and worldwide apology.

Q8. WHICH OPTION IS BEST - AND WHY?

In answering this question, assess which of the options described in Q7 is the best.

Recommend one of several options here, and argue for that recommendation, providing a solid basis in fact and reasonable/supportable conjecture.

Option 2 is best. Option 1 is likely to be an ongoing process within Google, as it is within many organisations. Option 3 can be incorporated into option 2, in that destroying the communications data in a way that can be verified will help to re-establish public trust. However, once the data is made available to authorities, its destruction may be delayed. For instance, in Australia legal requirements concerning data storage may require that data to be stored for up to five years before it can be destroyed.

Skills taught using the applied approach

A feature of this approach appears to be its focus on perspective. Two perspective related skills it teaches are *creating distance from subjective views* (the focus of the first bracket of four questions), and *stakeholder identification*. *Communication* skills can

also be taught using this approach. Q5 also builds the skill of *ethical literacy development*, whilst Q7 builds that of *formulating coherent responses to ethical challenges*. Q8 builds the skill of *communicating ethical decisions* that were made. However, this approach did not facilitate argument construction in the way Rationale did.

Discussion

The exploration of a philosophical and an applied analysis technique using this case study has highlighted several features of both approaches, as mechanisms for teaching ethical skill development. Although Rationale did not consider multiple stakeholder perspectives, it began with a stakeholder conclusion and then analysed it. That is, it decides the outcome of the argument (an end) in advance and then argues for and against it, whereas the DET works towards an end. Rationale, using philosophical logic, can be used to argue for the truth, or lack thereof, of a conclusion, unlike the DET, which has no measure of efficacy. However, the DET, unlike Rationale, can generate solutions that take into account multiple stakeholder perspectives. Table 1 summarises the skills that the two techniques chosen for this exploration can help develop.

Table 1: Comparing philosophic and applied approaches to ethical skills development

Rationale	Skill	How the technique can develop it
	Argument construction	By developing a map of the argument
	Critical thinking	By developing the argument in accordance with logic rules
	Ethical literacy	By applying philosophical formulations to the ethical issue in question to make a moral judgment

	Written communication skills	By converting the argument map into an essay
	Recognition of ethical issues	By converting the action in question into a moral conclusion
	Ethical decision making	By evaluating the ethical issue from the perspective of two philosophical formulations
	Ability to distance oneself from subjective judgements	By not only stating the reasons for each claim but also the objections to it
DET	Written communication skills	By responding to the technique questions
	Verbal communication skills	By participating in focused group discussions (active form of the DET)
	Stakeholder identification	By responding to Q1 and Q3
	Ability to distance oneself from subjective judgements	The first bracket of four questions
	Recognition of ethical issues	By responding to Q5
	Formulating coherent responses to ethical issues	By responding to Q7
	Identifying and evaluating possible	By responding to Q7

	courses of action	
	Ethical decision making	By responding to Q8
	Ethical literacy	By responding to Q5

The list of skills in Table 1 is not exhaustive, but limited to those focused on in the two techniques discussed. Furthermore, there are overlapping skills, such as the skills of *Formulating coherent responses to ethical issues* and the skill of *Identifying and evaluating possible courses of action*. Arguably they are closely related, yet the former has to do with the ability to communicate the latter.

On the one hand, Rationale enforces thinking, not just about the supporting reasons for the claims of the argument, but also the objections to the claims, which lead, in this case, to somewhat a more a balanced argument. On the other hand, the DET enforces thinking, not just about the facts and the ethical issues involved, but also the issues that gave rise to the ethical issues. Another way in which the DET differed from Rationale was in the area of producing options to solve the problem and making a recommendation in favour of one or a combination of the options. Rationale did not appear, during the analysis of the chosen ethical situation, effective at producing such outcomes. However, Rationale did, in this case, offer solutions from the perspective of the main stakeholders involved in the situation (the users whose data were being collected by Google). In addition, while both techniques appeared capable of facilitating critical thinking, the argument that Rationale helped produce, as a result of this analysis, appeared more balanced compared to the argument formulated using the DET. Unlike the analysis using Rationale, the behaviour of the ICT professional was a focus of the DET analysis from the beginning of the analysis to the end.

Conclusion

This exploratory study compared and contrasted one philosophical and one applied technique, Rationale and the DET respectively, to demonstrate their ability to develop ethical analysis skills. By analyzing an ICT ethical issue that was raised in a recent media article using Rationale and then using the DET this comparison can form the basis for a future study aimed at empirically evaluating the efficacy, strengths, weaknesses and the individual abilities of each technique with regards to ICT students' and professionals' skills development.

As the literature review section of this article has shown, ICT professionals are ill equipped in regards to the skills required to make moral judgments in relation to ethical issues that arise in the workplace. The techniques compared in this exploratory study have the potential to help students recognise ethical problems in the workplace, think critically and objectively about the ethical issues, make founded moral judgments in relation to those issues and come up with solutions to the ethical problems encountered. They also have the potential to help students formulate well-reasoned arguments and write clear and concise responses to ethical challenges.

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