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ICT Integrity: Rethinking the Australian Professional Code of Ethics.

Abstract

There have been changes over the last 20 years which affect ICT systems and services. These changes include developments in technology, such as even faster and smaller computers and other digital devices, the convergence of technology, the internet, and operational aspects such as outsourcing. Governments and professional societies have responded to these changes in the media, yet the Australian Computer Society's Code of Ethics has not changed. Perhaps it is time to update it? The functions of the Code include articulating ethical standards of the profession and providing guidance to resolve ethical quandaries. One needs to identify if a code is adequate to address changing practice and technological advances. If a code is inadequate then what can be done to address, consistently, these deficiencies? With the focus on the Australian context, the ACS Code's relationship with international standards and codification of ethics are considered. The issues considered include the lack of specificity, and the absence of a way to decide between ethical principles which may conflict in some situations. Which principles, if any, have a higher priority than others, and why? Further work is needed to identify how the Code of Ethics can best provide moral guidance to ACS members.

Keywords

Codes of ethics, ICT ethics, outsourcing, professional societies.

INTRODUCTION

Systems using information and communications technology (ICT) are not produced in an ethical vacuum. The values of many stakeholders are involved. Typically these stakeholders are suppliers, vendors, employees, contractors, trade unions, and clients, and those who are affected by the delivery of the final product. Increasingly, especially in globalisation and offshore issues, professional societies and politicians can also be involved. One way that professional societies address the diversity of values of so many different stakeholders is by requiring their members to adhere to their code of ethics. Major functions of professional codes of ethics include the requirement to articulate ethical standards of the profession; to educate practitioners and the public about ethical obligations; and to provide guidance to resolve ethical quandaries (Anderson et. al., 1993). Philosophical dialogue about alleged difficulty with codes of ethics includes works by Luegenbiehl (1983), Ladd (1995), Fairweather (2001) and Tavani (2004).

There are numerous terms in the literature for professional codes of 'ethics'. In this paper we follow the guidance of the International Federation for Information Processing (IFIP) (Berleur, et. al, 2004), in discussing two types of codes.

The first type, which Berleur et al refer to as the code of 'ethics/conduct', has a set of high level statements, concerning such issues as honesty and integrity. This code governs 'how the person to whom it applies conducts him or herself in an ethical manner' (Berleur, 2004, p 11). To avoid confusion, this type will be referred to as the code of conduct in the rest of this paper.

The second type of code refers to a 'code of practice' for professionals, which 'governs how the person to whom it applies carries out his or her work technically' (Berleur, 2004, p 11). This code includes a set of detailed statements related to the professional's particular occupational environment. These statements of practice are more specific and more likely to incur change over time, than the conduct statements. That is, the desire for honesty is less likely to change over time, than is the interpretation of the way in which honest dealings in the occupational environment are to function.

Typically, a professional society would define both types of code for its members in a single document, a good example being the Software Engineering Code of Ethics and Professional Practice. This is 'the standard for teaching and practicing software engineering by the ACM and IEEE-CS' (SECEPP,1999). In this paper, reference to a 'code' or a 'code of ethics' means a document which includes both types of code, covering conduct and practice. Other references will be made to a specific type of code under consideration, for example a 'code of practice'.

The problem we address in this paper is one in applied philosophy. Presuming that a professional code of ethics can usefully serve the education and guidance functions, there are three critical questions.

- How can one identify if the changing technology has reduced the ability of a code of ethics for use in ethical assessment? The code is to act as a guide. It should not be subject to frequent change, as each new technology or ICT work process comes along. Yet the inevitability of change in the ICT industry leads one to recognise that certain changes may require a review of a code of ethics, particularly with respect to its code of practice.
- Given a code that no longer meets some of the significant issues, what can be done to consistently revive the ability of the code of practice to serve this function without undermining the existing strengths of the code of conduct?
- For codes which do not specifically distinguish the practice and the conduct elements, how can one modify the practice elements without also modifying the conduct standards?

Comment [OKB1]: The 3rd bullet point is not really different from the 2nd. Certainly not different enough to be a 3rd "critical" question.

These concerns are not new. Each professional society has had to grapple with them at one stage or another. IFIP has recently suggested a series of high level guidelines to assess the strengths and weaknesses of codes of ethics (Berleur, 2004). Perhaps these guidelines could also help with the first of the above points, namely to re-evaluate the efficacy of an existing code, once significant change has occurred in the ICT industry?

Rapidly changing technology does have a negative impact on the adequacy of its professional codes; this paper describes that impact, and ways to ameliorate it.

In the ICT industry one has always had to deal with the relationship between ethical assessment and technology. A brief examination of the evolution of ICT professionals' codes will show that at earlier stages modifications were made to the codes to meet technological changes; and a desire to include their expanded sense of professional responsibility and behaviour occasioned by some of these advances. For example, a major revision of the ACS code occurred in 1985, to better accommodate concerns over computer based crime (Coldwell, 1987). Other changes have been made to include an aspirational function.

As mentioned above, many changes to the ICT industry have taken place since the last major revision of the ACS code, 20 years ago. This paper uses outsourcing as an example of a recent change in ICT which could be considered when reviewing the need to change the ACS code.

This paper also briefly examines reasons for modification to the ACM/IEEE ethical standards.

The paper then focuses on changes currently planned and in progress by the ACS. The paper identifies what were perceived as the major ethical shortcomings, and indicates the common elements required to meet the impact of changes in industry practice, in the education and technical functions of the ACS code. These common elements may be used as guidelines in the next generation of ethical code reform.

THE ICT OUTSOURCING DEBATE

Outsourcing has been an issue of concern for the ACS in recent times, as evidenced by two media releases by the ACS President (ACS 2003, ACS 2004a) and the release of an ACS Policy Statement on it (ACS 2004b), that had the backing of both the Government and the Opposition parties (*ref here*).

Comment [OKB2]: It was either both houses of government, or both parties. It was stated in one of the 2 media releases. I will have to recheck it.

Outsourcing has also been an issue in the wider ICT industry. The Australian Institute of Computer Ethics (AiCE) has an online discussion forum. In recent months, a major focus of multiple discussion threads, has been discussions on ICT outsourcing (AiCE, 2005). AiCE membership includes ACS members and other who are associated with ICT. The latter include professionals in engineering, law, agriculture and more – all people who use ICT in the professions and want to have input into ICT matters in Australia.

Outsourcing is often defined as “the delegation of non-core operations or jobs from internal production to an external entity (such as a subcontractor) that specializes in that operation. Outsourcing is a business decision that can be made for quality or financial reasons. The term also implies transferring jobs to another country, either by hiring local subcontractors or building a facility in an area where labour is cheap.” (Wikipedia, 2005). Outsourcing of jobs to another country is sometimes called off-shoring.

AiCE members saw ICT outsourcing as an issue impacting the Australian job market and ICT professionalism in this country. Members saw a number of ethical issues involved. These included the following:

Professionalism issues

- The implications on staff, such as the impact on employee control and morale. Do workers do a more professional job if they embody the firm's corporate memory or stand apart from it?
- Issues of professionalism, where corporate and individual values differ. An ICT professional has to harmonise society and corporate responsibilities. S/he professes to society that they will place society's interest foremost, in their use of their specialist knowledge.
- Issue of standardisation between the supplier and customer. This includes such considerations as the standards of professionalism such as for coding and documentation practices.
- Issues related to quality of service and the supplier's strict adherence to Service Level Agreements (SLAs). This strict adherence to an SLA may often mean that the supplier's staff are not inclined to make the extra effort for the customer, providing just the minimum of service quality.
- The issue of off-shoring and development. In developing systems, and particularly software, the hardest problem is getting a clear statement of requirements. Gathering requirements is the hardest part of software development. Requirements elicitation is a joint learning process through dynamic interactions between clients and developers, a process that involves risk of errors and misunderstandings. These inherent risks are exacerbated in outsourced and off-shored development projects, where communication is less interactive.

Privacy, copyright and intellectual property issues

- The implications on privacy and intellectual property which affect an organisation when they choose to outsource/offshore their services.
- Issues of copyright. When development occurs in-house, employers gain copyright of software written by employees. But when ICT outsourcing occurs, do contractors retain copyright of software they develop? Outsourcing contracts should address this issue clearly. Related issues are those of knowledge sharing and Intellectual Property.
- Particularly in relation to off-shoring, issues of security and privacy. Privacy laws can be different from one country to another, raising concerns that weaker privacy laws in an off-shore outsourcing situation involving work produced in another country, might affect information systems developed for the Australian context.

Social responsibility issues

- Economic ethics come into consideration too. Organisations have corporate values, for which they are responsible, for example to their shareholders. Is it ethical for a company to pay more than the most economic rate?
- Issues of casualisation and social responsibility. Casualisation involves a shift in employment from mainly full-time and permanent, or contract positions, to an increased

level of casual positions. One contributor put it this way: “Ongoing employment vs. contract: A marker of the casualisation of society [is] not necessarily an IT issue but a broader social issue and possibly a symptom of the increasing individualisation of social responsibilities.”

- Issues of societal costs, such as greater unemployment in the ICT sector in Australia. Related to this is the issue of greater distribution of global wealth, increased GNP for nations to which ICT is outsourced and greater employment opportunities in those countries. Whilst outsourcing does not always lead to off-shoring, this raises issues of protectionism.

Different aspects of ICT outsourcing can be unethical, ethical or ethically neutral. Its component elements can each raise different types of ethical issues. Or they could each be seen as nothing to do with ethics, but rather as a political or industrial issue.

WHEN DO CHANGES IN ICT NECESSITATE CHANGES TO THE CODE OF ETHICS?

In a domain which changes as frequently as that of ICT, a change in work practice, or the advent of some new technology, should not of itself constitute grounds for changing a code of ethics. Off-shoring is just one example of the type of change, which might also include the rise of the Internet or the impact of micro/nano computing; that makes us wonder about revising or reviewing our codes. Codes cannot be reviewed with every change that occurs.

To avoid ineffective continuous code reviews, procedural guidelines are needed within a professional society, that ensure regular review of its code or codes. How frequently should such a review be undertaken? Given the logistical difficulties involved, and based on observations of previous changes to codes in Australia and the USA, the authors contend that codes ought to be reviewed at least every 10 years. The ACM code was reviewed in 1992 and again in 1998, but not since. The ACS code was reviewed in 1975, and again in 1985, but not since then. By this reckoning a review of the ACS code is long overdue. The review procedure ought to also allow for reviews that are determined by major technology changes. The advent of a biological computer implanted in the brain might be the sort of thing that justifies immediate code review rather than waiting a prescribed period of time.

Comment [OKB3]: I think having such an extreme example as this last sentence, detracts from this paper. I think it is better to leave out this sentence, thus leaving the issue unspecified.

ICT professionals have always had to deal with the relation between ethical assessment and technology. Changes to codes of ethics have been motivated by a desire to include their expanded sense of professional responsibility and behaviour occasioned by some technological advances (Gotterbarn, 1996). Other changes were made to include an aspirational component in the code.

Why aspirational? To appeal for right behaviour, when enforcement is not possible. In medicine and law, a breach of the code of ethics can mean loss of ability to practice one's profession. Not so in ICT. An ACS member can be held accountable, through the ACS Disciplinary procedures. But 80% of ICT practitioners in Australia are not ACS members. Also, a member facing the ACS Disciplinary procedures could simply resign. Then s/he can continue to behave unethically; they simply can no longer claim to be an ICT “professional”, which is a right that the Australian Council of Professions (ACP, 2005) has restricted to use by ACS members only.

Gotterbarn (2000) writing about experiences in the development of two codes of ethics in the USA found that a critical issue is that of specificity, that is how prescriptive and detailed the code should be. Specificity has partly been addressed in the ACS Code of Ethics by recent work (Bowern, 2003) which resulted in a set of case studies identifying issues related to each of the clauses in the code. Some of the cases were drawn from published material (Burmeister, 2000; and Burmeister and Weckert, 2003); others were based on actual incidents known to the authors; and a few were invented to complete the set. This exercise has revealed some shortcomings in the ACS Code. For example, the clause stating ‘I must distance myself professionally from someone whose membership of the Society has been terminated because of unethical behaviour or unsatisfactory conduct’ is unfair and unworkable (Bowern and Weckert, 2005).

Comment [OKB4]: Here authors is plural, but the source quoted has “Bowern”, ie. a single author. Which is it?

Another approach to specificity is in the clauses of the code itself. In some instances the code of conduct does not change, but changes in ICT practice mean that the application of the code, as seen in the code of practice, is different.

Comment [OKB5]: This final paragraph does not fit. It is out of step with the argue before it. It either need to be removed altogether, or reworked to fit the context better.

LESSONS FROM THE EVOLUTION OF THE ACM/IEEE CODE

The solution to code modification is not purely technical. In the ACM/IEEE Software Engineering Code (SECEPP, 1999) it was important to include a broader sense of ethical reasoning in it. In evaluations of that Code by philosophers such as Herman Tavani, the decision making guidance of the preamble was considered one of its strengths. The international task force that developed the Software Engineering Code of Ethics and Professional Practice (SECEPP) was aware of a number of previously identified weaknesses of professional codes and made a conscious effort to address those in their code. Major motivations for writing the SECEPP was to document the professional responsibilities of software engineers, and those aspiring to be software engineers, in a way which could be used to educate practitioners and the public, and to facilitate ethical decision making in accordance with these responsibilities.

There have been two major problems in attaining these broad goals. One is based on the overly specific content of a code, in which the code attempts to define precisely a complete list of all of the ethical behaviour of a professional. Precisely defined codes are almost out of date the minute they are approved. This is especially true in professions as dynamic as ICT. On the other hand codes which are too general, which treat ethical judgement at its most abstract level, have been criticised for their failure to provide adequate guidance. This attack is often generalized into a simplistic criticism of all codes, because codes can never be complete and anticipate every possible ethical situation (Fairweather, 2001). Such criticism of codes are easily made, but are not very useful for they do not distinguish an incompleteness which is a shortcoming, from an incompleteness which is a strength. The SECEPP attempts to steer a middle ground between code imperatives which are too vague to give useful guidance, and the numbing precision of detailed imperatives which are locked to a particular stage of technology. Instead of appealing to a particular technical standard such as structured programming, which will change, the code appeals to the changing standards of the profession to address specific technical issues. By appealing to current best practices rather than naming a specific practice, as the standards change the particular technical items referred to in the code also change. This is a way to build a code which keeps current with the particular best standards of the profession.

The SECEPP code differs from that of the ACS, in that it also includes some general principles on ethical decision making to help guide the utilization of the specific clauses. For example, the preamble uses everyday English to advocate basic ethical approaches to decision making, and asks software engineers when making a decision guided by the specific principles in the code, also to:

- consider broadly who is affected by their work (utilitarianism);
- examine if they or their colleagues are treating other human beings with due respect (Kantianism);
- consider how the public, if reasonably well informed, would view their decisions (Gert and others); and
- analyse how the least empowered will be affected by their decisions (John Rawls).

The international SECEPP taskforce stated that 'without the aspirations, the details can become legalistic and tedious; without the details the aspirations can become high sounding but empty; together the aspirations and details form a cohesive code.' (Gotterbarn, 1999, p103)

Another concern is that in many cases it appears as if principles in a code could point in conflicting directions and thus the code itself does not direct the final decision. SECEPP admits it is incomplete, but does not suffer from issues of vagueness, because it provides general guidance for ethical decision making as indicated above. This still leaves open the possibility that the general principles may be in tension, in particular circumstances.

SECEPP has a clear hierarchy of values that facilitates the reduction of the instances of ethical tension. First its eight principles are listed in an hierarchical order. If this does not help in the final decision making, then the code has an overriding principle – that a concern for health, safety and welfare has an overriding primacy. SECEPP consists of a set of principles (code of conduct statements) and details or examples for each of the principles (code of practice statements). Its preamble contains some guidance on understanding and using the code. It is the preamble which facilitates it addressing some of the older philosophical criticisms of professional codes.

This structure of the IEEE-CS/ACM code has raised other comments, whereby some philosophers have taken the SECEPP taskforce to task for including guidance about using the code as part of a document called a Code of Ethics and Professional Practice. As the following paragraph shows, this criticism has not deterred the adoption of the SECEPP by a significant number of software engineers.

The SECEPP taskforce identified a set of common elements to the profession of software engineering. They did this without identifying a particular professional society’s preference for a particular culture’s ethical style. The evidence for that is in the number of professional societies throughout the world that have adopted the Code and translated it into their native languages. Currently the Code has been adopted by professional societies in Argentina, Australia, Canada, China, Croatia, England, Italy, Israel, Japan, Mexico, Spain, and the United States.

THERE ARE CURRENTLY SEVERAL CODES FOR THE ACS

The ACS Code of Ethics (ACS Codes, 2005) comprises two sections. The first section is a simple policy statement plus a declaration of six Values and Ideals; which are then expanded into the second section, a detailed set of 37 statements, which are called the Standards of Conduct. This Code of Ethics is defined as part of the ACS National Regulations, to emphasise the importance of the code, and to ensure its prominence in the ACS body of documentation.

Supplementary to the Code of Ethics is the Code of Professional Conduct and Professional Practice (ACS Codes, 2005). This code was developed to provide more practical guidance in the day to day activities of ICT professionals. It is not part of the National Regulations, which means that it is easier to amend and update. Changes to the National Regulations require a vote by the National Council, followed by a vote by all members of the ACS. This has implications for future amendments to the codes. Figure 1 illustrates these various codes.

National Regulations		Code of Professional Conduct and Professional Practice		
Clause				
4.	ACS Code of Ethics			
4.1 and 4.2	Policy Statement			
4.3	Values and Ideals	Introduction		
4.4 to 4.10	Standards of Conduct	<i>There is overlap between the Standards of Conduct and the Code of Professional Conduct</i>	Section A	Code of Professional Conduct
<i>There is no identified Code of Professional Practice in the National Regulations</i>			Sections B to L	Code of Professional Practice

Figure 1

The Code of Professional Conduct is 'intended as a guideline for acceptable personal conduct for each IT professional practicing in the industry', and as such it is complementary to the Values and Ideals and the Standards of Conduct. There is some overlap between these two codes of conduct.

Comment [OKB6]: I have gotten muddled trying to work through the terminology of this paragraph. I have tried to clarify the issues, but fear I have simply muddled the waters further. The point being made is an important one. How can we say it better?

The Code of Professional Practice is 'intended as a guideline for acceptable methods of practice within the IT industry'. The guideline is generic and addresses a range of aspects of the product life cycle, and acquisition, development, implementation and support processes. The Code of Professional Conduct and Professional Practice has never been updated since its adoption by the Society.

The ACS Code of Ethics (comprising a policy statement, the six Values and Ideals, and the Standards of Conduct) is a general code applicable to virtually anyone in the ICT industry; this is what has hitherto been referred to as the code of ethics, in this paper. There is however also the IEEE/ACM code (SECEPP) which is aimed specifically at software engineers. This second code was adopted in 2004 by both the ACS (Davidson, 2004), and the Institution of Engineers, Australia. The focus of this paper continues to be on the first, but with lessons on the development of the SECEPP code being drawn on, for recommendations of changes to the ACS code.

Future versions of the ACS Code of Ethics should:

- incorporate the Code of Professional Conduct, to ensure consistency with the Standards of Conduct, to produce a code consistent with the IFIP code of conduct;
- update and maintain the Code of Professional Practice as an equivalent to the IFIP code of practice; and
- rationalise the way that a part of the code is incorporated in the National Regulations to mandate its use, and the way that other parts of the code can be more easily updated.

Comment [OKB7]: I find the first 2 bullet points confusing

In 2003 the ACS established a national Committee on Computer Ethics (CCE). Amongst its terms of reference is 'to develop and propose relevant codes of conduct' (ACS CCE, 2003, p 5). The ACS Code is in need of change (Bower, 2003; Burmeister, 2000) because it is dated, and does not reflect ethical issues arising from technological developments, since the last major revision in 1985. Consequently it does not reflect the ethical issues of the widespread adoption of the internet, ubiquitous problems like Y2K, the human-computer interaction issues created by nanotechnology, nor does it adequately address the issues of outsourcing raised above.

The SECEPP code development has yielded lessons to be heeded. The extensive consultation process engaged in by that taskforce, needs to be emulated and followed by the ACS. IFIP also advocates an extensive consultation process, arguing that the 'process used to develop a code is as important as the code itself' (Berleur, 2004, p13).

DEFICIENCIES IN THE ACS CODE

A recent ACS report, including a small survey of ACS members active in the computer ethics field, has identified some deficiencies and potential improvements, as follows, in the ACS Code (Bower, 2003).

- The meaning and use of the Code needs to be clarified, to explain exactly what role the Code does, and should play, as a way to provide guidance and education.
- The role and activities of the Disciplinary Committee in the ACS should be reviewed and amended, if required.
- Consideration is required of whether the Code should take into account the fact that ACS members come from different cultural backgrounds, and that they may interpret some of the clauses in different ways.
- The code should be consistent with international standards since, although the software is developed or designed in Australia, it has international consequences.
- An editing process to resolve these existing issues should be established, ensuring that the Code is maintained to reflect the changing nature of the ICT industry.

The ACS CCE have identified the following additional deficiencies:

- In 1985 the "C" of ICT was not part of the self-description of the ACS membership. The code only indirectly addresses "C" type issues at this time.
- Unlike other codes around the world, the ACS code has no system of prioritisation, for the inevitable situations of conflict between clauses in the code.
- The power of sanction (disciplinary committee) relationship to the code is poorly defined.
- The need to resolve issues to do with a multiplicity of codes of ethics.
As mentioned already, in addition to the ACS Code of Ethics, the ACS has adopted the SECEPP code. Then too, there are many in the ICT industry who belong to specialist groups (management consulting, graphic design, software engineering, systems administration, human-computer interaction, and more). In some of these there are codes of ethics specific to that group. For example, the Systems Administrators Guild of Australia formed their own working group on Ethics, because they saw the ACS code as too general, lacking specificity for their work; they came up with their own code of ethics (*Lance, ??? date not shown on paper I have, track it down*). What is the relation of the ACS code to these other codes? Should there be one single code for all ICT professionals? What about in situations like SECEPP, a second code adopted by the ACS, what happens if there is conflict between such a code and the ACS code?

Disciplinary Committee

The roles and responsibilities of the ACS Disciplinary Committee are described in the Society's Rules and Regulations. IFIP argues that 'no code has any value in terms of public duty unless it is associated with a power of sanction such as disciplinary procedures' (Berleur, 2004, p12). However, Anderson, et al (1993) have argued that codes as education serve a useful function in educating and guiding decision making.

Whilst a laudable aim, the authors contend the IFIP view is not currently achievable. Professionalism in ICT, certainly in Australia, is still not at the same level as in engineering, medicine and law. As shown above, in Australia it is possible for a member of the professional society, who has been called to account for a disciplinary matter, to simply resign their membership. Upon their resignation, no further action by the professional society can be taken. However, in other professions, such as medicine, such opting out of the society is not possible. For this reason, it is the view of the authors that the greater emphasis ought to be on 'incentive' and 'education, rather than on 'discipline', in regards to a code of ethics in ICT.

Cultural aspects

Australia has a significant multi-cultural population, which is also reflected in its ICT workforce. Certainly the Code's audience consultation process should include members who come from different cultural backgrounds.

One debate is whether the code should contain clauses reflecting the cultural differences of its members. Part of this debate is whether the clauses of the Code should have a common interpretation, or allow for contextual and cultural variances. IFIP has argued (Berleur, 2004), on the basis of Kant's 'categorical imperative', for a universalisation, in which a code contains necessary 'minimum criteria, conditions, and requirements' applicable to all members of a professional society, regardless of cultural, social and/or legal context.

The authors argue that it is not an issue of cultural debate whether testing reduces the risks of software failure. The ethical responsibilities of a practicing professional, embodied in a code of ethics, are dictated by that profession and its technology. The profession knows the best standard (its code of practice) to satisfy these responsibilities.

National aspects

Gotterbarn (1997) describes the membership of the task force for Software Engineering Ethics and Professional Practices. It comprised people predominantly from North America and Europe, with a few other members, including one from Australia. During the development of the draft codes

Gotterbarn found that North American contributions to the codes predominantly followed obligations/rights ethics, whereas the bias in Europe was towards virtue ethics. His study identified that Middle Eastern and Australian views did not easily fall into either of these categories.

To the authors of this paper, the important point is to recognise that there are different approaches to ethics and to ensure that they are considered in the development of codes for ICT ethics. These different approaches - do something because it is the right thing, or do something because it is the will of some deity, or do something because it will produce the greatest good - address the basis for a particular belief. The affirmation of intellectual property, for example, can be based on any of these approaches to ethics; but once IP is affirmed in a code it is not subject to cultural relativism. The ACM/IEEE SECEPP sought principles, consistent with each type of ethics, that were standards of software engineering.

International aspects

The ACM and IEEE are international organisations and the task force was established to recognise that international character. An objective of the task force was to establish a code which would be accepted internationally. The ACS does have international members, and has entered into reciprocal agreements with a number of overseas computer societies, including several in South East Asia. However, the ACS does not have the same sort of international ambitions as those of the ACM and IEEE. Therefore it might be argued that any redevelopment of the ACS code would generally focus on the needs and issues relating to Australian ICT professionals, although those of the international members should not be forgotten.

However, the development of computer systems and software are international activities, and have international impact; and those aspects must be reflected in codes of ethics. If the ACS is to meet the needs of the profession, it is the needs the international ICT profession that must be met. If the ACS comes up with a principle that is uniquely Australian, then we should question whether it really was a principle of the profession.

This issue of global versus Australian principles in a Code comes out in outsourcing as well. Off-shoring raises many different and interesting economic issues, but from the technical point of view as a software developer it is bad software development. In developing software the hardest problem is getting a clear statement of exactly what the customer needs and the best way to meet those needs. Gathering these requirements is actually the hardest part of software development. The elusive character of software requirements is a long-standing issue. If we characterize requirements elicitation as a joint learning process in which shared understandings evolve through dynamic interactions between clients and developers, it is apparent that this process involves risk of errors and misunderstandings. These inherent risks are exacerbated in outsourced software development projects, where communication processes are less interactive. The use of outsourcing, in any situation that mitigates against this interactive development, is inconsistent with professional software development.

Guidance and education

Further work is needed to identify how the ACS Code can best provide guidance and education to its members. Current attempts by the CCE at accomplishing this are mainly through better communication and publicity of the code to ACS members.

Some members of the CCE have produced a set of case studies related to each of the clauses in the ACS Code (ACS Cases, 2004), which have been publicised to members. Since late 2004 the CCE has arranged for a regular column in Information Age, the ACS bi-monthly magazine for members and other professionals in the industry. The column seeks to promote the code, and discuss the ethical aspects of current ICT news items or scandals. The case studies are a source of material for these articles.

The CCE will also seek to arrange regular sessions at the ACS Annual Conferences at which industry and academic speakers can address issues of the code of ethics. Already greater use of the ACS web site has been made for this purpose.

Advice should be provided on how the Code would apply to the wide range of ACS members, some of whom are not directly involved in systems development, for example ICT professionals dealing directly with customers, such as some empirical software engineers. If the ACS Code is to cater to the widest possible interpretation of 'ICT professional', it must be examined for its applicability to all aspects of the profession. An excellent example has been set through the ACM/IEEE Software Engineering Code, that has recently been adopted by the ACS for its members who are software engineers (Davidson, 2004). The adoption of the software engineering code is another contribution to the specificity of codes for the ACS.

A POSSIBLE APPROACH TO CODE REVISION

Moor (1999, p65) defines policies as 'rules of conduct ranging from formal laws to informal, implicit guidelines for action'. So a code of ethics could be considered as a set of policy statements about how a professional should behave, in ICT in this case. The on-going development of technology coupled with the malleability of computers means that there will always be a need to develop new policies.

One framework that will aid ACS deliberations is James Moor's Just Consequentialism. Moor (1999, p65) comments on the problems rising from conflicting ethical theories and believes that 'ethics needs more unifying theories that call upon the various strengths of the traditional approaches to ethics'. His Just Consequentialism theory, or framework, is discussed and summarised with respect to cybertechnology, in Tavani (2004, pp59-60). The framework consists of two steps:

- *deliberate* over various policies from an impartial point of view to determine whether they meet the criteria for being ethical policies (for example, they do not cause unnecessary harms, and support individual rights);
- *select* the best policy from the set of just policies arrived at in the deliberation stage by ranking ethical policies in terms of benefits and (justifiable) harms.

This approach would appear to be one way to consider the issues described above, and the CCE will consider its use when revising the ACS Code of Ethics.

CONCLUSION

Just as a motor vehicle should have regular services, so should a code of professional ethics. With a vehicle there is typically a major service infrequently, and more regular minor services. In the case of the ACS Code of Ethics, there have been numerous minor services and lots of tinkering, since the last major service in 1985. It is long overdue for its next major service.

The use of a suitable code of ethics is necessary for the successful development and implementation of new applications of ICT. It is also necessary for the promotion of public trust in the professionalism of those in ICT. Codes are a tool for assessing the ethics of new technologies, such as nanoizing technology, and new ways of working within ICT, such as the treatment of participants in a testing process, and in outsourcing services to an overseas organisation. Change in ICT is a fact of life.

Professional societies need to put in place procedural mechanisms to ensure regular (at least every 10 years) reviews of the codes, to ensure their ongoing relevance. The ACS requires ICT professionals to keep up to date with changes in the industry. No less should be required of the professional code of ethics.

How codes of ethics addressing ICT practices are changed requires deliberate thought and planning. One way is to appeal to current best practices rather than naming a specific practice, as technical standards change the particular technical items referred to in the code also change. This is a way to build a code which keeps current with the particular best standards of the profession and overcoming the risk of the code becoming out of date by rapidly changing technology.

In changing a code, there is a need to put metrics in place to ensure the efficacy of those changes. IFIP has developed high level guidelines to assess the strengths and weaknesses of a code of ethics. Such guidelines can help in this process, though more work is needed to turn these metrics into a reliable code assessment tool.

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