

# ETHICS AND REGULATION IN THE ICT INDUSTRY

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# EXECUTIVE SUMMARY

## Background and Overview

This Ethics Report is the most comprehensive Information and Communications Technology (ICT) ethics study ever undertaken in Australia and, we believe, within the world.

This groundbreaking project was conducted by the Centre for Applied Philosophy and Public Ethics (CAPPE), funded primarily by the Australian Research Council (ARC) and supported by the ACS (Australian Computer Society).

The Report examines the current climate of ethics and regulation within the Australian ICT industry, identifies ethical challenges and recommends a series of practical solutions.

As the ICT sector grows and matures as an industry, the role of Ethics and regulation within an ICT context has never been more important. The rapid advance of technology, its increasingly ubiquitous nature and the growing impact of ICT on broad business, community and economic outcomes demands a robust and consistent system of checks and balances to ensure professional outcomes are safely and efficiently achieved.

There is an urgent need for the industry, governments and the business community to recognise the need for clear ethical frameworks. Whilst it is not the role of this Report to quantify the financial impact of ICT ethical behaviour on the business community - we need look no further than recent local and international news reports to witness the profound consequences of negligence in this area.

The Report identifies four main areas that require attention in order to improve the standards of ethics and regulation within the Australian ICT industry. These four areas are:

1. **Ethics Education** - there appears to be a mismatch between what is taught and what professionals see as the most important ethical issues.
2. **Code of Ethics/Conduct/Practice** - various ethics codes within the ICT industry are not valued and are ineffective.
3. **Professionalism including licensing/certification** - many in the ICT industry do not see themselves as professionals and do not understand the value of adhering to professional standards.
4. **Integrity in ICT** - ethics as it is practised in the ICT profession is inadequate; it is ineffective and poorly regarded. A new integrity system is required

Key challenges identified by this Report include: compromising quality of work to meet deadlines, unprofessional behaviour<sup>1</sup>, privacy concerns, false promises by peers, and conflicts of interest within the workplace.

From this analysis, a new Integrity Systems Model is proposed which holds industry members accountable for their actions to help advance and improve the level of ethical behaviour and regulation in the Australian ICT Industry. A summary of recommendations is included on page [xvi](#) while the main body of recommendations begins on page [46](#).

## Survey and Analysis Process

The Report examines the state of ethical behaviour and regulations in Australia through a series of qualitative interviews and a comprehensive survey of ICT professionals. Analysis of these results highlights strengths and weaknesses of codes and regulatory mechanisms currently at work within in Australia.

Results from this Report are derived from empirical research and philosophical analysis. Empirical research is based on a quantitative survey conducted between the period of 10 July 2006 to 31 January 2007 of 354 individuals and in-depth interviews which were conducted on 28 ICT professionals between the period of 1 January 2007 to 31 December 2007. The study's participants were drawn from the industry generally and varied across a number of demographics including age group and gender. These participants were broadly representative of the general population of Australian ICT workers.

## The Current State of Ethics and Regulation

There are currently no agreed standards or regulations that establish, monitor or set benchmarks for ethical behaviour across the full Australian ICT industry workforce. To benefit employers in working in this innovative industry, the ACS (Australian Computer Society) Australia's leading ICT representative body of Australia, established its own standards of ethical codes of professional conducts and professional practice. The current components of the ACS Integrity Systems Model includes:

- Code of ethics, code of professional practice
- Disciplinary committee
- Articles on ethics in the ACS magazine *Information Age*
- Ethics as part of the core body of knowledge
- Certification of university ICT qualifications
- Endorsement of computer ethics conferences
- Input (expert opinion) into government policy
- Commissioned work (eg. ethics case studies)

However, these standards hold only ACS members accountable for their behaviour, non-members are not regulated by these standards. Whilst individuals and some organisations may have integrity systems, the purpose of this report is to outline an integrity system that bridges this gap, and provides an industry-wide ethical integrity system.

## Summary of Findings

We found, as a result of the research carried out, four areas of major interest: education, codes of ethics, ethics problems, professionalism including licensing/certification, and a new integrity system. These were chosen as the empirical research indicated that they were areas that needed to be reviewed and corrective action taken, to remedy, what the research indicated, were serious problems.

## Education

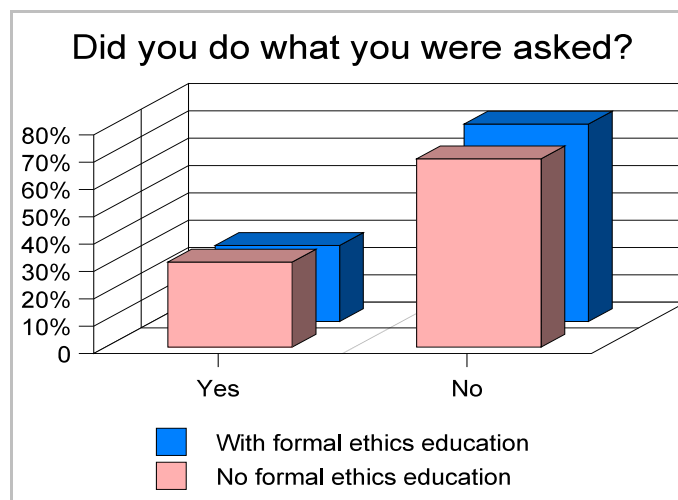
Three main ethics education issues have emerged from the Survey and literature:

- There is a significant gap between theory and execution - in other words, between what is being taught about ethical behaviour within the ICT industry and the actual behaviour of ICT professionals.
- Those with ICT qualifications have been shown to exhibit poorer standards of ethical behaviour than those who did not have ICT specific qualification.
- The teaching of ethics within the ICT curricula is ineffective. It may be that ethics in ICT is not being taught by the appropriate professionals.

This indicates that there is a considerable disparity between what is taught within the ICT curricula about ethics, and what are the major ethical issues within the industry.

Some of the key findings from the education section include:

- Those with ICT qualifications were less likely to say they would speak up against unethical behaviour, than those without ICT qualifications;
- ICT specific qualifications made no difference to whether individuals claimed they would act on what they thought;
- Disturbingly, 83.3% of respondents with ICT specific qualifications admitted to doing what they were asked even though they thought it was unethical, as compared with (75.5%) of those who did not have ICT specific qualifications. (page 22 of the report). This suggests that ethics education as it is currently structured has only marginally assisted ICT employees making ethical decisions.



**Figure 1** - Ethics Education and Acting Ethically

- Sixty-two per cent of ICT professionals said they did not find ethics training helpful.
- The study found the number of men and women who reported completing formal ethics education is especially low, considering that three-quarters of the respondents claim to have ICT specific qualifications, while all but one of the 38 Australian universities is ACS accredited with a required ethics module. (See Appendix A - Part 3 Ethics Education Research for the details of this.)

Despite the fact that many (though not all) of those interviewed for this project expressed strong support for ethics education, the survey suggested that ethics education as part of an ICT course, appeared to have no significant positive effect on the ethical decision making or ethical behaviour of those working in the industry.

## Codes of Ethics/Conduct/Practice

The research indicated that within ICT the various codes about ethics are ineffective and not valued. They are seen as irrelevant documents that are signed off on but not integrated into an individual's decision making. Codes need to be integrated into a wider integrity system that encourages their use. The codes should be viewed as practical tools that can assist with autonomous, ethical decision making.

## Ethics Problems

A variety of ethical challenges were identified throughout the survey, with five issues highlighted as the main concerns of those working in the ICT profession.

These include:

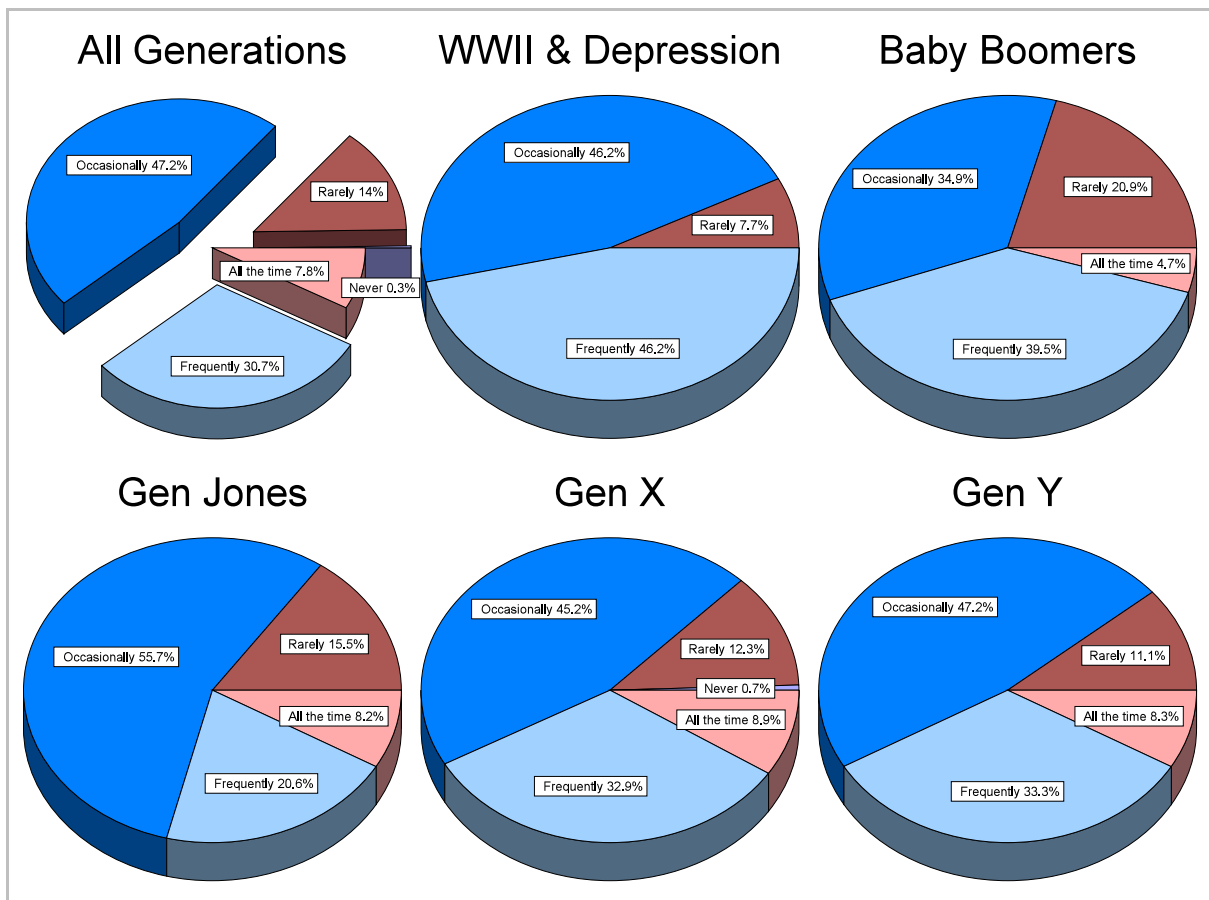
- Compromising quality of work to meet deadlines
- Unprofessional behaviour
- Privacy concerns
- False promises
- Conflict of Interest

Contrary to expectations, work experience made almost no difference to the way respondents answered the survey. The five main ethical problems were experienced throughout all levels of work.

The table below demonstrates the top five ethical problems ranked by each generation in the ICT industry.

<b>Table E - Top Five Ethical Problems</b>								
	Compromising Quality	Conflict of Interest	Unprofessional Behaviour	Privacy	False Promises	Copyright	Malware, Viruses, etc.	Compromising Functionality
WWII and Depression (< 1946)	1	5	2	3	–	–	3	5
Baby Boomers (1946 - 1954)	1	3	2	5	4	–	–	–
Gen Jones (1955 - 1964)	1	1	4	5	3	–	–	–
Gen X (1965-1980)	1	5	2	2	4	–	–	–
Gen Y (1981 -1999)	1	–	4	1	–	3	4	–

The report also revealed that it was broadly considered that unethical behaviour occurs frequently - with no significant generational differences concerning the perception of how often unethical behaviour occurs.



**Figure 2** - Frequency of Unethical Behaviour

The above table shows that for all respondents unethical behaviour occurs at least occasionally more than 85% of the time. This holds true for all generations. Of course the goal is for unethical behaviour to occur not at all but any movement towards rarely is to be encouraged and seen as more realistic in the short term.

## Professionalism and Professional Responsibility

The Report has determined that professional conduct which encompasses understanding and adherence to established ethical standards within the industry is not sufficiently understood or highly valued amongst ICT workers. Professionals have special responsibilities and this sense of responsibility is not as strong as it should be amongst ICT workers.

There is some evidence from our survey and interviews that many in the ICT industry do not see themselves as professionals and have no interest in seeing themselves in this way. Unfortunately the term ‘profession’ has a variety of uses. It is often taken to refer simply to a person’s occupation, and so encompasses everything from shop assistant to neurologist. However we want to consider being a professional from an ethical sense. Some of the comments from the interviews suggest that there is not a strong commitment from all ICT workers to professionalism. While only one comment states explicitly that “most IT people do not want to be professional” there are other statements that the professional body, the ACS, is elitist or exclusive. The fact too that there is vigorous discussion regarding licensing and certification in

the industry suggests a view that ICT is not a profession.

Does it matter if people in the ICT industry do not see themselves as professionals? Yes. Professionals have special responsibilities over and above the responsibilities that the rest of us have. A professional medical doctor, for example, has the responsibility to provide health care. There is the worry therefore that perhaps this sense of responsibility is not as strong as it should be amongst ICT workers. This is reflected in one of the arguments against certification of ICT workers where it is pointed out that such certification would, or could, make the workers accountable. We feel that this attribution of responsibility and accountability is a goal worth striving for. ICT professionals ought to feel, and ought to be held, responsible and accountable, just as members are in other professions.

## Licensing and Certification

Results from this project have found there has been only limited discussion around licensing and certification with most conversations being centred on software engineering. However, the research also shows that those within the ICT industry have little need or desire to be licensed or certified. As licensing has legal ramifications and certifications require a certain skill set and knowledge, there has been resistance to the proposition. This further demonstrates a general disinterest of those in the ICT industry to be recognised as ‘professionals’. The main objection to licensing and certification is that it “would expose software developers to malpractice suits”. This in itself is no objection, as all other professional industries are in the same position.

Our research found inconclusive results arguing for and against both licensing and certification of ICT professionals. Much more work and investigation is needed to determine if either or both licensing and certification are either necessary or sufficient for our profession.

## Regulation

A major criticism of ICT industry codes of ethics is that there is no real consequence or termination of work if a code is breached, as there is in other professions such as the medical industry. This is due to the lack of industry wide regulations on ethical behaviour. Naturally, this can result in an undermining of the value and impact of such codes. The results in this report indicate current codes of ethics and practice have little or insignificant value within the ICT industry, with findings revealing that current ethics and integrity systems are not valued or effective.

The new Integrity Systems Model aims to rectify this by suggesting industry members are held accountable for their actions.

The report also reveals that formal education in ethics has not been helpful or assisted employees in the workforce. Although just over 80% of respondents were aware of ethical codes and regulations, just over 55% of ICT industry employees said they have found ethics regulations helpful or effective. Again this demonstrates the need for a new integrity system for the ICT industry.

**Table W - Question 19.** In your workplace, do you know of any regulations that are supposed to address or prevent unethical behaviour? Regulations can be any known process, procedure, policy, guideline, legislation, or any other formal means of letting people know how to behave ethically. An example is a Code of Ethics.

Response	Number of Responses	Percent of Total Responses
Answered	348	98.3%
Did Not Answer/Missing	6	1.7%
Total	354	Percent of Answered Responses
Yes	285	81.9%
No	46	13.2%
Unsure	17	4.9%

**Table W - Question 20.** If you replied yes to question 19, are they helpful/effective?

Response	Number of Responses	Percent of Total Responses
Answered	298	84.2%
Did Not Answer	56	15.8%
Total	354	Percent of Answered Responses
Yes	156	52.3%
No	54	18.1%
Unsure	88	29.5%

This might lead to the perception that the ICT industry does not currently value the ACS codes of ethics and its associated codes for professional behaviour. Clearly there is a need for the industry to value ethics.

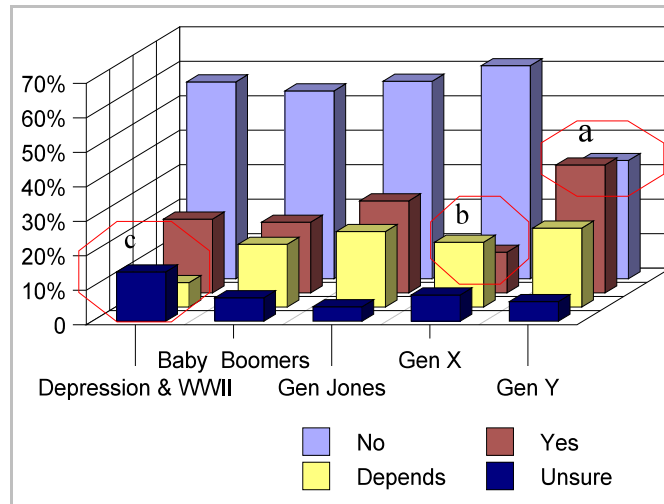
## Other Considerations

In addition to the above areas in need of attention, the differing results between the generations in the ICT industry are worth mentioning.

### Age - Generations

Interestingly, the study has determined that Generation Y (1981-1999) was the only generation to have significantly different results regarding the standard of ethical behaviour in the workplace. They thought ethics ought to be less important in general: That ethics shouldn't play such an important role in the industry.

The graph below demonstrates the generational divide when asked if job security made a difference to their reaction to requests to behave unethically. Gen Y overwhelmingly stated that job security did make a difference to their reactions to behave unethically. This response just outnumbered the response that job security did not make a difference, but all other generations had significantly wider difference between if this factor influenced their reactions or not.



**Figure 3** - Reaction to requests to behave unethically

All generations but Gen Y overwhelmingly chose no over yes. Even then with Gen Y the difference was close:

- (a) the yes responses just outnumbered the no. The other generations had a wide difference between yes and no;
- (b) Gen X was the only generation where the Depends responses outnumbered the Yes;
- (c) The WWII and Depression generation was the only group where the Unsure responses outnumbered the Depends responses – they were the most unsure.

## Integrity in ICT

From the analysis of the research it is clear that ethics as it is practised in the ICT profession is inadequate: it is ineffective and poorly regarded. By examining the current state of ethics regulations in the ICT industry and comparing it with what is regarded as good ethics practice we arrive at recommendations for a new integrity system. The task, which is formidable, is to replace the current mechanisms with a comprehensive integrity system.

What exactly this means is described broadly below and in detail in the main body of the report (beginning on page 46). In summary though it means developing policies, procedures, techniques, and tools designed to ensure the greatest penetration of ethics thinking, deciding, and behaving into the profession. These comprise; an ethics infrastructure, prevention and resolution techniques, integration methods, and management tools.

## A New Integrity System

Developing a new integrity system for the ICT profession is crucial for the growth and development of Australia's ICT industry.

Results analysis has revealed the value of ethics and it's incorporation into the ICT Industry is inadequate and in need of complete re-structure. It is suggested by the authors that an ethical



integrity system, which holds industry members accountable for their actions, is required to improve the current climate of ethics in the ICT industry. This study revealed those working in the ICT industry are not interested in becoming professionals and an integrity system which addresses ethical standards, behaviour and accountability may be met with resistance.

Broadly speaking, an integrity system aims to provide a set of non-legal mechanisms which ensure ethics governs daily decision making processes, thoughts and behaviours. The general structure of such an integrity system needs to contain; an ethics infrastructure, prevention and resolution techniques, integration methods, and management tools.

A broad outline of the structure of the proposed integrity system is as follows:

- The ethics infrastructure contains;
  - a definition of the specific group (here, the ICT profession) or body of knowledge that the integrity system is meant for, an ethical notions priority ranking scheme, and tailored – codes of ethics, codes of conduct, and regulatory mechanisms<sup>2</sup>.
  
- The prevention and resolution techniques section contains (amongst other things);
  - education programs (for both students and practising professionals), reviews, committees, helplines, audits, training, and penalty free whistleblowing.
  
- Integration models are;
  - checklists to ensure that ethical considerations are placed in all decision mechanisms, policies, procedures, and education.
  
- The management methods required for the integrity system include;
  - the assigning of responsibilities for maintaining the ethics infrastructure, monitor and review both the ethical performance of those within the scope and the effectiveness of the integrity system; taking action to ensure that the proper processes are followed in both the day to day use of the integrity system and in the invocation of preventative and resolution techniques; ensure that enough resources (people, information, etc) are available for the day to day use of the integrity system and in the invocation of preventative and resolution techniques; independent of audits of both the day to day use of the integrity system and in the invocation of preventative and resolution techniques; governance of the integrity system.
  
- The management tools needed to carry out the above methods include;
  - Ethical Decision Support System; Ethics Impact Statement and Ethics Risk Assessment Statement; Ethics Priority Ranking Scheme; Ethical Conduct Review Procedure; Ethical Assessment in Employment Practices (to gauge ethics of prospective employees and ensure ethical employment ); Ethics Audit Procedures; Ethics Integration checklist; Resolution Processes (to Repair, Restore, Recompense).

Applying the integrity system to ICT should be approached just as any other system would be; with a systems development focus. This includes management, standards, governance, testing, QA, risk analysis- the whole panoply of tasks, procedures, and methods that exist in ICT.

A recommended approach to tackle this problem comes from an information life cycle point of

view. That is, from the inception of the need for information (normally known as user requests), through the whole systems development process (initiation, feasibility, systems analysis and design, building, implementing, and maintenance), and ongoing operation of the system. There are a large number of texts and other guides (such as industry best practices) that prescribe how this is to be done and it is not our intention here to suggest which approach is best. An example of the process, using one common approach, is given in the appendices.

The above outlined structure is necessary in order to provide cohesive, workable and achievable changes to the current integrity systems within the ICT industry.

## The Role of the ACS

The ACS is a member of the Australian Council of Professions<sup>6</sup> but unlike many other members of the Council, it does not have the same power over the profession as do many other professional bodies because there is no requirement for members of the profession to be certified or licensed. Therefore, there are currently limitations in what the ACS can do about ICT professionals who do not adhere to ACS standards of conduct. The ACS can suspend memberships, however this does not impede people from working within the industry. The ACS plays an important role in the education of ICT professionals through the certification of courses, by providing courses and by organising and sponsoring events such as conferences and seminars. Its publications assist in this role as well as providing more general information, particularly in the case of the *Information Age*. The ACS has input into the development of ICT policy, regulation, and standards.

This helps the ACS promote the improvement of ethical standards and professionalism amongst the industry, as well as being socially responsible by supporting a standard of ethical behaviour to protect ICT industry professionals. It demonstrates to those outside the industry that the ICT industry takes itself seriously as a profession and is aware of its role in the wider community. This is important for the public image of the profession and the development of public trust. The ICT industry will join most other industries in being bound to an understanding of ethical and moral standards of behaviour within the workplace.

## Summary of Recommendations

The recommendations that we make here recognize the following factors:

- (a) The diverse nature of the ICT industry with respect to occupational groups;
- (b) ICT workers are employed in a wide variety of organizations and industries;
- (c) There is no one body that has authority over the whole ICT industry; and
- (d) Although the standard of ethics is not legally enforceable, the ACS will incorporate a standard of ethics into their membership base, and promote moral professional standards within the industry.

Keeping in mind the above points, the ACS is best placed to implement these recommendations, which it believes can enhance integrity systems in the industry and thereby improve both the professionalism of ICT workers and ethical standards in the ICT industry.

An overview of the recommendations arising from this Report include:

1. A new integrity system be constructed using the outline proposed in the section A New Integrity System (see [46](#));
  - A concerted effort be expended at once to create a project plan to carry out the areas of immediate concern: ethics education and issues surrounding the professional status of the ICT industry;
  - A project plan be created to determine how to implement the new integrity system;
  - Once sufficient profession specific detail is known of the integrity system, work should begin on creating software to support it;
2. The purpose and use of ethics committees be radically altered to include proactive agendas such as the development of ethics problem prevention programs,
3. That the current ethics committee disciplinary procedures be enlarged to include the broader category of ethics resolution;
4. Ethics reviews and audit procedures be developed (under the auspices of the ACS) examining the profession as a whole and by each professional as a personal ethics examination;
5. Principle support from the ACS should announce in principle support for the research agenda in the further research section (beginning on page [51](#)) of the recommendations so as to give researchers a programme for the future.

Specific recommendations on education focus on:

- The content of Ethics Components;
- The structure of Ethics Components;
- Teachers of Ethics Components;
- Ethics training courses for businesses/organisations.

Specific recommendations on codes of ethics focus on:

- Tailored codes for the various occupational groups within the ICT industry;
- The integration of the ACS codes into the organizations codes;
- Ensuring that such codes are a component in a whole of work-life integrity system.



**A REPORT ON  
ETHICS  
AND  
REGULATION  
IN THE AUSTRALIAN  
ICT INDUSTRY**



# 1 Introduction

The ICT industry is diverse. Not only are there many different occupational groups but a diverse range of industries employ people in ICT. There are ICT consultants and ICT businesses but there is also a vast range of other industries that have ICT departments or employ ICT specialists. If we accept that all those who work in ICT regardless of the main business of their employer or organisation, are part of the ICT industry, then not only is it beyond the scope of this project to define an integrity system for the industry as a whole, but probably beyond the scope of just about any project. Added to this problem of diversity, there is no professional organisation that has authority over the whole industry. The ACS and other professional bodies have authority over their members but over no-one else. They do of course have influence in ways that are spelt out later, and the recommendations made in this report target that influence and hopefully provide ways of extending it in order to raise the ethical climate of ICT in Australia.

This report contains recommendations of what needs to be done to address the perception (and reality, as it turns out) of unethical conduct committed by ICT professionals, or at least those who have technological expertise. This view is held, not only by the public, as demonstrated through media reports, but also by many ICT professionals themselves. The only points these two groups differ on are which particular ethical problems come up and how frequently they occur.

This report goes beyond merely providing an empirical foundation for the above perceptions; it proposes a remedy as well as pointing to other actions and research that need to be carried out. To achieve this the structure explained in the paragraph following is used to examine the breadth and depth of the many and various issues that need to be explored to provide a comprehensive set of recommendations.

The section examining the CURRENT STATE OF INTEGRITY SYSTEMS IN ICT (beginning on page 7) has as parts, the role of the ACS, a look at general ethical notions, various regulatory mechanism such as codes of ethics, examines integrity management, and a summary account of the survey, interviews, and other research that was carried out. Following is, there is a Discussion section (page 35) which covers the important results of the survey (such as ethics education in ICT), interviews, and other research. Finally, the Recommendations section (page 46), puts forward a new integrity system as well as a research agenda, which has three levels of importance: immediate, long term, and further research. As a concluding part of the Recommendations we suggest ways of implementing the recommendations – the way forward.

To provide the necessary supporting material to explain, justify, and otherwise inform the reader we have a second volume containing appendices. These are: APPENDIX A – EMPIRICAL RESEARCH which contains the survey (results, detailed analysis, and justification), in-depth interviews (results and detailed analysis), ethics education research, and research into the public perceptions of ethics in the ICT industry; APPENDIX B – INTEGRITY SYSTEMS where we provide the foundational arguments for ethics management, some regulatory mechanisms, and four examples of attempts to systematize ethics management; APPENDIX C – DEFINING THE ICT INDUSTRY contains a discussion on the difficulties of defining the ICT industry (which should be read in light of some of the survey results); and finally APPENDIX D – BIBLIOGRAPHY which contains all the references and other source material that was used in the compilation of this report.

## 1.1 Purpose

The title of the project is “Ethics and Regulation in the ICT Industry”. The regulation with which we are concerned is not so much that which is legally binding but rather more informal regulation, that is rules, customs, procedures, and the like that help to govern, in a non-legal sense, the behaviour of ICT professionals. These regulations together with the underlying ethical norms and principles comprise an integrity system. The overriding purpose of the project then is to examine the current integrity system and provide ways of enhancing it in order to improve the ethical conduct of ICT professionals, in other words, to make the industry more professional through being more ethical.

### 1.1.1 Project Description

The broad aim of this project is to provide a comprehensive analysis of the current integrity system of the ICT industry, to define a new integrity system including standards of professional competency and ethical conduct, and outline a regulatory model applicable to the whole industry.

An integrity system is the assembly of institutional mechanisms designed to reduce corruption and other inappropriate behaviour, and to promote an ethical climate.

An integrity system should provide:

- 1) ethical standards and goals;
- 2) accountability mechanisms, disciplinary mechanisms at professional level; and
- 3) preventative and promotional processes, eg. ethics training, reduced opportunity for inappropriate behaviour.

A variety of these regulatory framework options are available. For example, some models emphasise self regulation rather than external regulation, and others emphasise meta-regulation. And some regulatory models comprise a few broad principles instead of many specific rules. Our model incorporates the best and what is necessary from each of the above models.

Integrity systems also operate at a number of levels: industry as a whole, corporation or individual business, and professional. Overarching all of these is the legal system. This project focusses on the ICT industry, and particularly on the ICT profession as it is involved in the industry and within corporations and businesses. The report provides a general background on integrity systems and on the ICT industry, focus on the survey and the interviews that form the basis of the empirical investigation of the project, and provide discussion and recommendations.



### 1.1.2 Project Outcomes

The chief deliverables, aimed at achieving the overriding purpose of the project, are:

- a detailed report that includes recommendations;
- a dual purpose conference;
  - to inform ICT professionals of the current state of thinking on issues related to ICT integrity systems and
  - to provide papers for a special issue of the *Australasian Journal of Information Systems* and to form the basis of an edited book aimed at ICT professionals;
- A reference text suitable for tertiary teaching and professional use. (Note the papers in the *Australasian Journal of Information Systems* , and the reference text will be available online.

As well other publications have been produced:

- two edited academic collections;
- academic articles and book chapters;
- professional articles, especially in *Information Age*; and
- presentations at ICT conferences;

and

- A PhD thesis on informed consent in ICT.

Additionally, various reports on the project have been published in the popular press.

## 1.2 Methodology

The project was approached in the knowledge that, in the past, there were many anecdotal stories about unethical behaviour in the industry but little to base a serious and systematic examination of ethics in the industry. To provide a solid foundation for proceeding to a comprehensive integrity system a variety of methodologies were employed which can be broadly grouped into empirical research and philosophical analysis.

The empirical research comprised:

1. a quantitative survey (to obtain data about the industry especially, attitudes towards and occurrence of, ethical problems),
2. interviews (to complement the survey and obtain a better understanding of attitudes),
3. survey of current offerings of ethical education in tertiary institutions, and
4. literature reviews (to obtain data on the current situation and recent developments).

The philosophical analysis was used to clarify concepts and analyse ethical arguments.



## 2 CURRENT STATE OF ETHICS AND REGULATION IN ICT

Prior to describing the current state of ethics in the ICT industry it is useful to give an overview of general ethical notions.

### 2.1 General Ethical Notions

A comprehensive and systematic integrity system would be based on a set of basic ethical notions that are generally accepted in the society. In a liberal democratic state they would include values like do not harm others, do good to others, behave justly and fairly, respect human rights, be honest, keep your promises, and so on. Some of these are concerned with the consequences of actions and others with the nature of the action itself. While there will be some variation in how these are interpreted in different contexts, and in how individuals prioritise them, they are, by and large, uncontroversial and in fact necessary if we are to live together harmoniously in a liberal democracy. The ethical notions and principles embedded in the codes of ethics, incorporated into educational programs, encouraged in behaviour and so on are based on those basic values.

Which of these higher level ethical values that are considered important, will vary considerably depending on context. To our knowledge there has previously been no research done in the ICT industry, and certainly not in Australia, to ascertain which ethical notions are the most important to professionals in the industry or which are most important to society in regards to ICT. The research undertaken here has given an indication of what those values are and their relative importance (see Table E on page [x, 25](#)). The ethical issues of most concern to ICT professionals were compromising quality to meet deadlines, unprofessional behaviour, making false promises, conflict of interest, and privacy and intellectual property. Those of most concern to society, at least as reported in the media, were surveillance and monitoring, privacy, outsourcing, intellectual property and copyright, and professionalism. Interestingly, texts used in ICT ethics courses reflect the latter list rather than the former, a point to which we will return.

Having a better idea of what these values are assists in developing codes of ethics, educational programs and so on.

Before proceeding it is worth considering two common misunderstandings that suggest that it is pointless talking in general about ethics. The first is that ethics is relative in one of two ways; (i) ethical values might be relative to a culture so that what is right or moral is so in one culture but not in another, or (ii) ethical values might be subjective or personal. What is morally right for me may not be for you, because we have different values. The first of these, often called cultural relativism, need not concern us here, because we are talking primarily about the current situation in Australia, not some culture completely foreign to ours. The latter, subjectivism, is clearly mistaken. If a society is to function there must be shared ethical values which most people adhere to most of the time. Ethical values are not merely personal or subjective. If they were, murder, rape and paedophilia would not be morally wrong but merely matters of moral taste, clearly an unacceptable position.

The second common misunderstanding is that it is largely pointless talking about ethics because the law takes care of all important issues. However, there is some misunderstanding in the profession about what constitutes ethics and why ethics cannot be reduced to a set of

regulations, as exemplified in the following quotation from the interviews: “there is an international standard that we have to abide by call the Sarbanes-Oxley legislation (US) dictates how a company deals with ethics”. This confusion needs rectifying. The primary practical reason that ethics cannot be reduced to a set of regulations is that it is not possible to have an enforceable regulation to cover every action in every situation. Even it were possible the cost of enforcement would be prohibitive. If we are to have efficient working environments (and social environment) we must be able to rely on most people behaving morally, for whatever reason, most of the time (this includes behaving morally out of self interest). The only alternative to ethical behaviour is a draconian police state.

## 2.2 Integrity Systems

As we have just shown, there are good reasons why it is desirable to encourage a climate in which there is an awareness of ethical issues and in which people act according to ethical principles. We may recognize the in-principle desirability of fostering personal ethical values like honesty, integrity and competence but even where there is no such idealistic motivation, there is a pragmatic reason for promoting a climate of ethical behaviour. An ethical climate provides a more efficient environment in which people can be relied upon to do the right thing - they can be trusted - and therefore less monitoring and surveillance, which involve a considerable overhead, is required. The existence of industry wide ethical norms (as opposed to ethical considerations governing the actions of particular members) also has the advantage of providing a level of consistency for different industry members which can serve to clarify expectations and coordinate behaviour. This can also act to foster public trust by establishing a level of consistency across the industry.

However, although it might be agreed upon that the existence of some kind of cohesive ethical climate in the ICT industry is desirable, an awareness of and responsiveness to ethical considerations is not something that necessarily emerges naturally. The existence of workplace bullying and corruption in some professions demonstrates that the culture of a workplace can in fact be a major contributing feature in unethical behaviour. The promotion of an environment in which people are aware of the ethical dimension to their actions and act accordingly then requires some type of management.

This is the purpose of integrity systems. Integrity systems are non-legal institutional mechanisms designed to reduce inappropriate behaviour and to promote and support an ethical climate. According to Miller, an integrity system “is an assemblage of institutional entities, roles, mechanisms and procedures, the purpose of which is to ensure compliance with minimum ethical standards and promote the pursuit of ethical goals”. These mechanisms might include behavioural codes, unofficial sanctions, meetings in which ethical topics are raised, education on ethical issues, mechanisms of accountability and so on. As this suggests “integrity ‘systems’ are a messy assemblage of formal and informal devices, processes and roles” (Miller) focussed on developing and maintaining the individual integrity of the members of the organisation. For example, codes of ethics include standards of conduct and occupational ideals to guide members; a statement of the fundamental goals of the occupation; and the principal rights of members of the occupation in relation to groups such as employers, peers and clients. These codes clarify the kinds of behaviours that are expected from members. They can be used as a resource to help make decisions and guide behaviour (especially in situations which are not covered by legal regulations), as well as a tool for raising awareness about particular ethical issues that may not otherwise be obvious. Unofficial sanctions are a means of punishing inappropriate behaviours. These may include cautions, reasons for promotion or demotion or other such means of

encouraging or discouraging particular behaviours. They operate as clear feedback on behaviours. The role of ethical discussions is to raise awareness of ethical issues and encourage industry members to engage with them. Such discussions could be structured or informal, and take the form of discussing real cases in the industry or introducing hypothetical ethical scenarios.

The mechanisms employed in integrity systems have the goal of institutionalizing ethical values into norms of behaviour that guide action. Some of these values will be general and apply to all, for example, honesty. Others will be more specific to a particular role, and the integrity system should make clear the virtues of particular roles. What are the virtues that must be developed and maintained in that role? For example, a particular virtue of an HCI developer is sensitivity to potential users with disabilities and to cultural sensibilities, whereas a network manager should be particularly sensitive to privacy and security issues.

Integrity systems are intended to promote and sustain ethical values in such a way that they inform the actions of industry members on a day to day basis, rather than simply being ideals that exist only in codes or policies that have little concrete relevance. The existence of an ethical climate serves to indicate and reinforce what is expected and acceptable behaviour from industry members. It can influence what questions are asked and what is identified as an issue worthy of consideration.

In addition, integrity systems should identify the nature and causes of ethical failures, in order to be able to help provide remedies. For example, the most frequently seen ethical problem for ICT professionals is compromising quality to meet deadlines (see Table E on page [x](#), [25](#)). This is a professional focus problem and emphasises the notion of duty and its failure.

The elements of integrity systems that we have mentioned so far have been preventative, for example, codes, ethics training, and so on. These elements are designed to create a climate in which unethical behaviour does not occur. However, these systems must also have reactive components to cope with unethical behaviour when it does occur. These are typically complaints procedures and disciplinary systems and the like. Enforcement mechanisms are an important part of integrity systems, but they are only one part. The preventative elements that attempt to inculcate ethical principles and create an ethical climate should be at the fore.

Another aspect of integrity systems concerns whistle blowers. Whistle blowers can play an important role in maintaining the integrity of an organisation and therefore mechanisms should be in place both to protect them and to assess their claims fairly.

The purpose of an integrity system is to improve or maintain standards of ethical conduct so it is useful to consider briefly why people might behave ethically. That can give insights into the design of integrity systems. Punishment for unacceptable behaviour is obviously one motive. The strongest of these are legal sanctions but others can be more informal sanctions in the workplace or even the disapproval of colleagues. A more positive reason is self-interest or benefit to oneself. This could be in the form of rewards, perhaps with respect of promotion, or the approval of colleagues. Finally, and the most praiseworthy, is the desire that many have to behave well - to do the right thing. To a large extent, this is the attitude that an integrity system is designed to encourage.

While it may be a little idealistic to think that people in general will behave ethically just because it is the right thing to do, there is a clear link between ethics and self-interest that has little to do

with institutionalised rewards, a link that is provided by reputation (this relates back to the second motivation in the previous paragraph). Miller call this the virtuous triangle - reputation - self-interest - ethics. It is in our self-interest to be highly regarded, to have a good reputation, and this is enhanced by behaving well. This point is discussed extensively in the literature on trust. In general people like to be trusted and tend to feel insulted, at least slightly, if they are not trusted. This desire to be seen as trustworthy in turn is an incentive to behave in a trustworthy manner. The desire to have a reputation of trustworthiness is a matter of self-interest that can be achieved through ethical behaviour. While this motivation is not always paramount and can on occasion be overridden by other considerations, for example financial gain when “we can get away with it”, it is an importation one that must not be overlooked when considering integrity systems. In summary then, such systems should have punishments to discourage bad behaviour, rewards to encourage good behaviour, and contain elements that create or maintain a climate where trust can flourish and reputation can be built on trustworthiness and good behaviour. It should be noted here that in a situation in which there is a high degree of monitoring and surveillance, and associated punishments, there is little room for trust and therefore little room for the development of a reputation for trustworthiness.

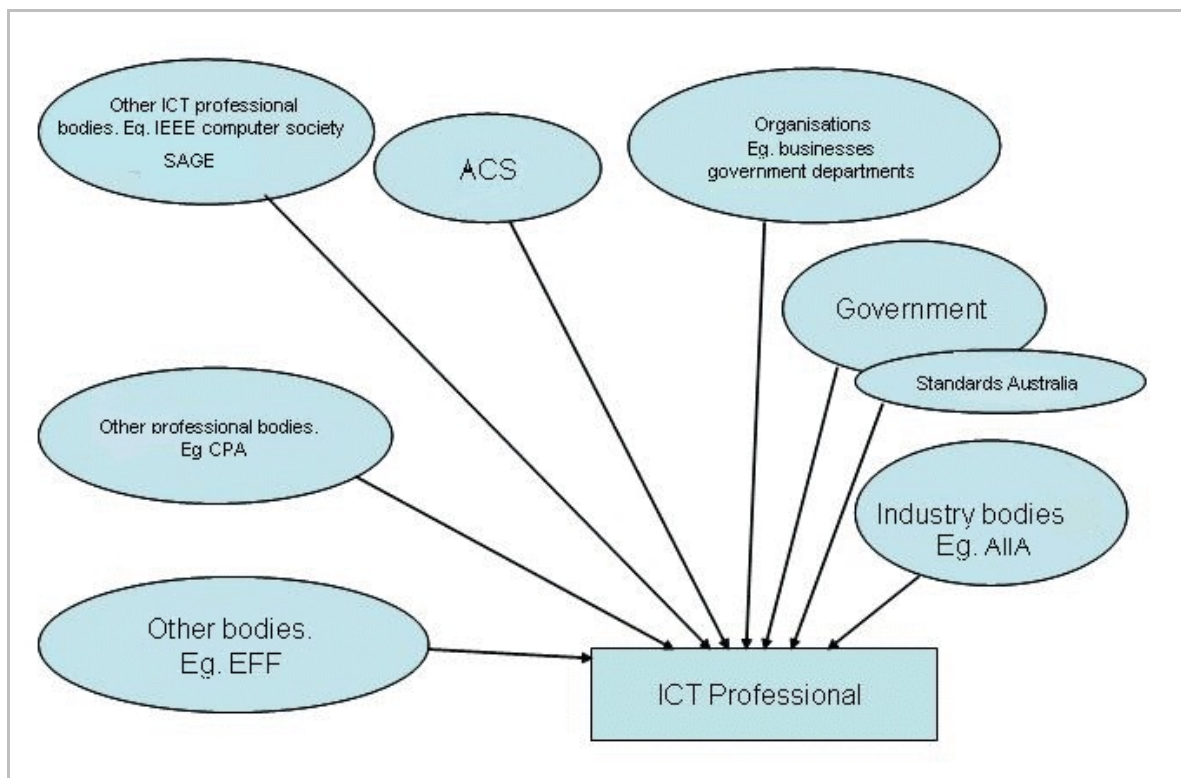
## 2.3 Integrity Systems in ICT

### 2.3.1 Introduction

While there is a plethora of codes of ethics and related mechanisms such as ethics committees, we found no evidence of any overarching and systematic ethical frameworks in any ICT industries worldwide; that is, no comprehensive integrity system.

This is not surprising and there are at least four reasons why it is difficult to talk of the, or an, integrity system in the ICT industry. First, the industry is diverse; it is not even clear where the boundaries lie. Second, many in the industry do not work for ICT organisations. Third, there is no formal certification required to enter the industry. While Australian universities and TAFE colleges offer degrees in, or have major studies in, ICT related courses, most of which are ACS accredited, there is no requirement to have successfully completed such a course in order to be employed in the industry. Finally, there is no professional body to set and enforce standards as is the case in many other professions, for example in medicine and accountancy. While the ACS plays an important role (to be discussed in the next section), only a small percentage of the industry workers are members<sup>3</sup> and it has no power over those who are not, and its powers over its members is limited. It has disciplinary procedures such that members can be expelled, this has no bearing on their capacity to be employed in the industry.

The current situation in Australia is something like:



**Figure 4** - ICT Professionals' Relationships

ICT professionals can come under many different umbrellas. Some are members of the ACS and so are subject to its rules and regulations, and others are members of other professional ICT bodies, perhaps the IEEE Computer Society<sup>4</sup>, or perhaps the System Administrators Guild of Australia (SAGE AU)<sup>5</sup>, which was mentioned quite frequently in the survey. Still others can be members of other professional bodies, for example the CPA. Employers of ICT professional, be they private companies or government departments, all have their own rules and regulations, codes of ethics, and so on. Industry bodies, such as AIIA, AEEMA, IFIP also play a part. Governments create legislation, enforce the rules and regulations that they enact, and set standards through Standards Australia. In addition, professional and industry bodies, employers and other bodies such as Electronic Frontier Foundation<sup>6</sup> and Computer Professionals For Social Responsibility<sup>7</sup> have input into government legislation.

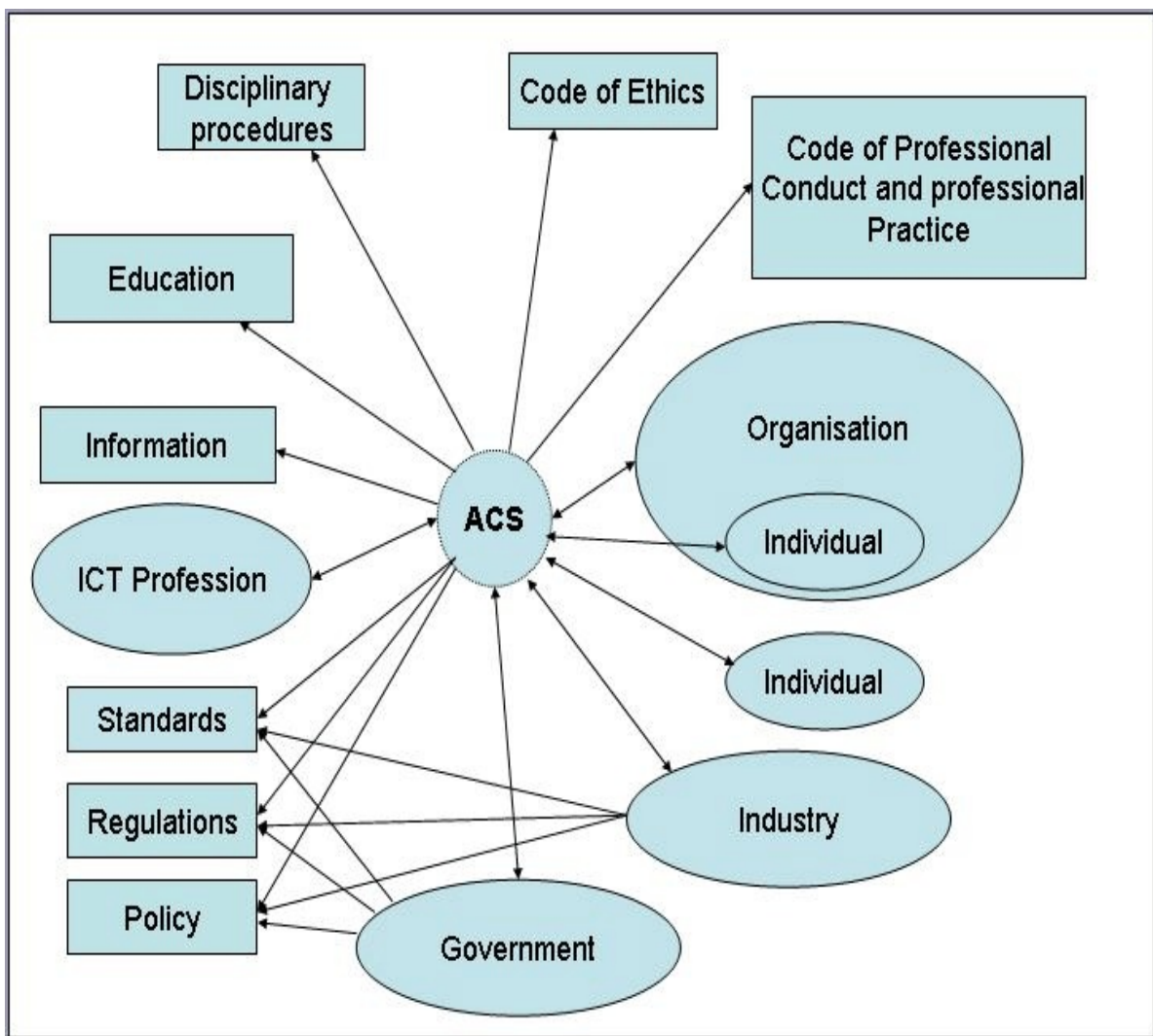
In summary then, ICT professionals can be subject to any one of a number of integrity systems, for example, that of their employer and their professional body (if any). All of course are subject to government regulations and various standards (such as CoBIT and ITIL), and to various stakeholders. Hopefully all of the integrity systems will have the elements discussed in the previous section, but there is no *one* current overall system to be discussed. What can be discussed however is what an integrity system for the ICT industry should look like, and whether there should be one body that oversees the industry in the way that, say, the Australian Medical Association oversees the medical profession.

A complete description of an ICT integrity system would need to examine all of the above mentioned groups and their interrelations, a task beyond the scope of this project. We therefore limit ourselves by focussing on the ACS and its various relationships and what role it can play as an example of the role that organizations like the ACS can have. We precede this with a brief outline of its current role.

### 2.3.1.1 The Role of the ACS

The ACS is a member of the Australian Council of Professions<sup>8</sup> but unlike many of the other members, because there is no requirement for members of the profession to be certified or licensed, it does not have the same power over the profession as do many other professional bodies. The ACS is therefore restricted in what it can do about those ICT professionals who do not live up to ACS standards of conduct. If they are members of the ACS their membership can be suspended but that does not stop them from working. If they are not members there is nothing that can directly be done by the ACS. It is important therefore to understand what the role of the ACS is and what it can do, in order to recommend ways that it might influence and improve the conduct of ICT professionals.

Diagrammatically the current role of the ACS can be represented something like:



**Figure 5 - ACS Relationships**

The ACS has interactions with, and hopefully some influence on, individuals in the industry, organizations that employ many of those individuals, governments, and the ICT industry. It has its own code of ethics and, code of professional conduct and professional practice that are guides for members' professional behaviour. The ACS plays an important role in the education



of ICT professionals through the certification of courses, by providing courses, and by organizing and sponsoring events such as conferences and seminars. Its publications assist in this role as well as providing more general information, particularly in the case of the *Information Age*. The ACS has input into the development of ICT policy, regulation, and standards. For example, it has recently been involved with Standards Australia in developing standards for ICT project governance. Furthermore, membership of the ACS indicates an awareness of ethical issues and a commitment to the creation and support of an ethical environment in the profession. Membership of the ACS indicates that a professional is aware of the ethical issues found in the industry and willing to comply with certain standards of behaviour. The visibility of the ACS promotes an ethical profession. It demonstrates to those outside the industry that the ICT industry takes itself seriously as a profession and is aware of its role in the wider community. This is important for the public image of the profession and the development of public trust.

Importantly, the ACS provides practical resources, such as codes of professional conduct and practice, a code of ethics and accompanying ethical case studies, certification of ICT courses, avenues for publication of and discussion of relevant ethical issues, for example conferences and both academic and professional publications, disciplinary procedures, input to government policy, information about training programs, that form part of an industry-wide integrity system.

The current ACS integrity system then can be taken to include the following:

- ▶ codes of ethics, conduct, and professional practice,
- ▶ disciplinary procedures,
- ▶ educational requirements,
- ▶ publications,
- ▶ conferences, and
- ▶ mechanisms for input into policy, regulation, standards.

This overview of what the ACS can do and is doing suggests the areas in which it will be fruitful to make recommendations for further activity. The role of the ACS or some other relevant body however would be much stronger and it would be much more able to uphold ethical standards, if there was some form of certification or licensing for ICT professionals as there is in many other professions. This is dealt with in the next section of this report, DISCUSSION (beginning on page [35](#)).

### 2.3.2 Codes of Ethics, Conduct and Practice

The ACS has a Code of Ethics consisting of six ideals, a Standards of Conduct that explains those ideas, and a Code of Professional Conduct and Professional Practice, which is divided into a Code of Professional Conduct and a Code of Professional Practice. The former “is intended as a guideline for acceptable personal conduct for each IT professional practicing in the industry”. The latter “is intended as a guideline for acceptable methods of practice within the IT industry”. Additionally, the ACS has endorsed the Software Engineering Code of Ethics and Professional Practice.

In explaining the difference between the codes of ethics and conduct on the one hand and the code of professional conduct and practice on the other, Bovern, et al (2006) comment that unlike the high level statements of the code of ethics/conduct, the code of professional conduct and practice contains statements that are more detailed, more specific, and concern the professional’s particular occupational environment. They note that these statements are also more likely than the high level ideals to change over time. For example, the requirement for honesty is not likely to change over time whereas particular interpretations of what constitutes

honest dealings in the occupational environment may change with changed circumstances.

This distinction between codes of ethics/conduct and codes of professional conduct/practice is generally in line with IFIP custom. The IFIP differentiates between the code of ethics/conduct and the code of professional practice (Berleur, et. al, 2004). The code of 'ethics/conduct' contains a set of high level principles concerning such issues as honesty and integrity (Bower, et al, 2006), while the code of practice is "more specific and aimed at the application of 'good practice' in a given working or occupational environment" (Berleur, et. al, 2004).

Berleur, et. al (2004) add that while the code of conduct/ethics "governs how the person to whom it applies conducts him or herself in an ethical manner", the code of professional practice "governs how the person to whom it applies carries out his or her work technically". Moreover, whereas the code of conduct/ethics must be based on ethical principles and stated in terms of guidelines, the code of practice must either refer to the related code of conduct or embody the ethical principles of which the code of ethics is based (Berleur, et. al, 2004).

### 2.3.3 Regulatory Mechanisms

There are various ways to control the behaviour of ICT professionals and many attempts to do so. The most common of course is government legislation, and various software products (eg. Covalence, Q-RES, etc.) have been developed to assist in compliance with various regulations.

#### 2.3.3.1 Governance

A great deal has been written about the need for governance of the ICT industry generally and individual groups that see ICT as a significant part of their organization. There are a number of ICT governance systems (see the examples in the section Integrity Management Processes below) available. However it is significant that they do not refer to ethics, nor do they refer to ethical notions, a code of ethics, or code of conduct as their basis.

#### 2.3.3.2 Disciplinary Procedures

The ACS has disciplinary procedures in place which can be used to discipline members whose behaviour is deemed to be in conflict with the ACS Code of Ethics. Members can have their membership suspended however because there is no certification system in the industry, it has no effect on their employment. The ACS procedures obviously have no effect on non-members. There are of course government regulations that govern the kinds of unethical behaviour that are also illegal and individual organizations have their own disciplinary mechanisms.

#### 2.3.3.3 Certification

The ACS is currently in discussion with IFIP and various other professional computing bodies (eg. BCS) regarding the certification of ICT professionals.

### 2.3.4 Integrity Management Processes

Given that there is no explicit overarching integrity system in place in the ICT industry in Australia it is not surprising that there are no overarching processes that look at the ethics of the ICT industry. There have been some attempts to examine some of the individual pieces that would make up a management process; an example would be an ethics committee. However,

typically such committees are severely limited in their scope and effectiveness. While it is good that such attempts address management of ethics issues in ICT they are restricted strictly to management and do not address overarching and higher order issues of governance.

There have been various attempts in other parts of the world that seek to address the lack of overarching processes to manage ethics in the workplace in general. Internationally there have been new forays into this field. For example there is: **Values Management System**<sup>ZfW</sup> (VMS<sup>ZfW</sup>) developed in Germany, **AccountAbility1000** (AA1000) standard developed in Great Britain, the Spanish **System of Ethical Management** (SGE), and the Italian **Quality of Social and Ethical Responsibility of Corporations Project** (Q-RES)<sup>9</sup>.

These systems share the common objective of promoting and facilitating ethical practice in the business world. All of these systems have been developed by business ethics research institutions in consultation with a broad range of stakeholders, including companies, non-profit organisations, economic associations, academics, experts, government representatives, and civil society<sup>10</sup>. In some cases, new non-profit organisations have been established to oversee the development of these systems, such as FORETICA which controls the SGE project.

The various systems differ in terms of the background assumptions they make and the manner in which they assist organisations with their ethical management. The VMS<sup>ZfW</sup> and SGE systems, for instance, note that organisations are already likely to be informed by a set of background ethical positions defined by the broader society, earlier business ethics approaches, the law, etc<sup>11</sup>. Hence these approaches task an ethical management system with extrapolating and evolving those ethical practices likely to be already present within an organisation. To this end, the VMS<sup>ZfW</sup> system draws on the existing practices of companies, and supplements the information gathered with the theoretical insights of the research institutes consulted.

It is difficult to ascertain precisely which companies have adopted, or are considering adopting, ethical management systems. However, VMS<sup>ZfW</sup> has been applied to medical practices, construction companies and global organisations<sup>12</sup>. The Q-RES system, meanwhile, has been applied to companies in the banking, pharmaceutical and electricity generation industries, in addition to other companies<sup>13</sup>. It remains unclear, from the information surveyed, whether any IT corporations have adopted an ethical management system.

Whilst we are unsure whether any IT companies have adopted ethical management systems, it is clear that a number have commissioned ethics audits. Whilst ethics management systems have typically been designed, and certification overseen, by non-profit entities or groups, these ethics audits are generally conducted by private enterprise. One such provider is the Swiss-based Covalence SA<sup>14</sup>, which was founded in 2001<sup>15</sup>. Covalence audits in the order of 300 companies in 14 market sectors<sup>16</sup>, providing regular reports (some at cost, and some freely available) on the relative ethical performance of the companies surveyed. In addition, Covalence is explicitly engaged by a number of clients for the provision of their auditing services, most notably, in the context of the present report, the IT corporation Hewlett-Packard<sup>17</sup>.

Like Covalence, many other private sector companies, such as OpenPages and Integrity Interactive, are finding viable business opportunities in assisting companies with their ethics management<sup>18</sup>. One burgeoning field is the provision of ethics training via e-learning. Companies, such as Oracle, have acknowledged the need for training and have responded by training 42,000 of its employees in ethics and compliance via an e-learning system<sup>19</sup>. In essence, an IT solution is being adopted by an IT company in order to enhance its management of ethical practices. Stahl (2003), however, has pointed out that using IT in the implementation of ethical

management systems (and we can infer by extension in the provision ethics training) can introduce ethical issues of its own<sup>20</sup>. He draws attention, in particular, to issues of unequal access to computer resources<sup>21</sup>, and the lack of human-to-human communication in many computer systems<sup>22</sup>.

Clearly, certain corporations within the IT industry are taking significant steps towards ensuring ethically sustainable practices. In particular, companies are commissioning ethical audits and utilising e-learning for ethics education. It remains far from clear, however, whether any IT companies have adopted the perhaps more stringent and demanding standards and procedures imposed by integrity systems. Perhaps this is due, in part, to the daunting array of options available and, in part, to the lack of any government or internationally mandated standard for integrity systems.

The incompleteness of the current approaches to ethics within organisations serve to motivate a different approach, such as that of ethical management. Ethical management systems for the ICT industry seek to put in place a holistic, sustainable framework that ensures that standards of ethical behaviour are met. They may utilise codes of ethics or compliance measures, but only as part of a broader set of strategies and activities. They have emerged, in part, by analogy with other organisational systems. Proponents of ethical management systems hold that just as quality, safety and environmental concerns are handled via quality assurance, safety management<sup>23</sup> and environmental management processes<sup>24</sup>, ethical processes should be managed to a comparable degree.

Proponents of ethical management systems highlight the inadequacies of current approaches, such as systems of legal compliance and codes of ethics. As an OECD recommendation on ethical conduct in the public service notes, compliance systems can encourage employees “simply to function on the edge of misconduct, arguing that if they are not violating the law they are acting ethically”<sup>25</sup>. Moreover, systems of legal compliance can blind companies to the ethical issues that arise throughout a product’s entire life cycle by prompting them to concentrate solely on clearing regulatory hurdles<sup>26</sup>. Similarly, a detailed case study of a company involved in Hong Kong’s highly competitive and, at times, ethically compromised construction industry highlights that the development of a code of ethics alone does not guarantee widespread adherence to the code within an organisation<sup>27</sup>. It is not that compliance systems or codes of conduct are inherently faulty mechanisms but rather that, when applied in isolation, their aims are seldom achieved<sup>28</sup>.

#### 2.3.4.1 Education

The ACS recognises the importance of ICT professionals having exposure to ethics education in their professional training by making it a component of the core body of knowledge for all ACS accredited courses. A survey was conducted of ICT degree courses in all Australian universities (see Appendix A - Part 3 Ethics Education Research). The survey was of the course descriptions on the web sites of the universities only and no attempt was made to contact the universities to obtain more detail. Of the 38 universities surveyed 12 had designated ethics and social issues subjects, 24 had no designated subjects but there was evidence of components in other subjects, and in 2 universities no evidence was found of any discussion of ethics and social issues. It does not follow that these 2 universities do not cover these issues, just that nothing of relevance could be found on their web sites.

#### 2.3.4.2 Evaluation, Monitoring, and Reviewing

There appears to be no mechanism for systematic evaluation, monitoring or reviewing of the state of ethical behaviour in the ICT industry. Currently a comprehensive review of the ACS Code of Ethics is underway and other reviews are carried out when it is believed that they are required.

#### 2.3.4.3 Decision Making Process

There has been little discussion within the ICT industry of the kinds of decision making processes that might be helpful to ICT professionals in their ethical deliberations. Though there exists generic decision making procedures for ethics none of these have been suggested for use within the ICT industry.

The ACS however has made a move in this direction by establishing a website of case studies related to its Code of Ethics. There is potential for developing this further.

#### 2.3.4.4 Other Systems and Processes

In general ICT systems have many processes and procedures (besides strictly ethical ones) which are used as guides in the development and management of ICT systems: CoBIT and ITIL are prime examples of these. Currently these standards incorporate neither the consideration of ethical frameworks nor any mention of ethical values. Such standards ought to be reexamined by starting with ethical values and frameworks and be rewritten to include such. They should come to compliance through good, ethical, professional practice.

#### 2.3.5 Summary

In this section we have summarised some of the main components of an integrity system (though they are usually, but incorrectly, referred to as ethics management systems) that are in current practice. Overall in the ICT industry there is not an integrity system that applies to the industry as a whole. The ACS does have a coherent, if perhaps loose, set of practices and procedures that can be classed as a partial integrity system but this applies primarily only to ACS members, although its effect is broader given ACS input into policies and so on.

## 2.4 Overview of the Survey

The purpose of the survey was to gain a better insight into the ethical issues and problems as seen by members of the profession and more generally to discover attitudes, perceptions and practices in the profession. This was necessary to further empirical input to the new integrity system.

### 2.4.1 Introduction and Demographics

We asked the respondents<sup>29</sup> a number of questions that were organized into three parts; demographic data, substantive questions, and follow-up indicators. The demographic data consists of twelve questions of the usual type for surveys: age, gender, experience, geographical location, work classification, formal credentials, and so on. The substantive part consisted of twenty-five questions which related to knowledge of, and reaction to, (un)ethical behaviour in the Australian ICT industry. The final section of the online survey (the follow-up indicators) asked if the respondents wished to participate further in this research with an in-depth interview.

The follow-up indicators (Q.38 – Q.42) asked the respondents if they wished follow-up their survey answers with an in-depth interview and to leave their details if they did so. Nearly half (46%) of the respondents indicated they would like to participate further.

### 2.4.2 Survey Validity

The survey was assessed for validity<sup>30</sup> across three criteria: sampling, reliability, and representativeness.

#### **Sampling**

Ideally a random sample of all Information and Communication Technology (ICT) workers in Australia would have been selected to complete this survey. However, a complete sampling frame listing all such workers in Australia was not available to us. In addition, as it was not ethical to compel anyone to complete the survey, there would in all likelihood be a very low, self-selecting response rate. This is particularly the case with online surveys. Therefore non-random sampling methods were chosen to obtain as large a sample as possible to increase the reliability of the results of the survey.

#### **Reliability**

To ensure that responses were reliable and honest, respondents were assured of their anonymity with the exception of any identifying information they chose to provide. If respondents did provide such information in their comments, the researchers assured them that this information would be held confidential. If they chose to provide their names and contact details for follow-up interviews, respondents were also guaranteed that this information would be stored separately from their responses. This would ensure their responses could not be identified individually. This is sufficient to ensure reliability within this context.

Furthermore, this survey tended to reinforce results from surveys in other areas, for example, the efficacy of codes of ethics and of ethics education in the field of business.

## Representativeness

As it was not feasible to collect a random sample of ICT workers in Australia, nor was it ethical to force completion of the survey, the representativeness of the sample was understandably compromised to some extent. However, it is reasonable to assume that if the proportions of certain demographics in the sample are commensurate with the proportions of these demographics in the population of ICT workers in Australia, then the results should be representative of that general population. If that is the case, then reliable inferences can be made from the results of the survey.

The figures for age and gender suggest that the sample obtained for the survey was representative of the general population of Australian ICT workers. They also suggest that any gender and age inferences made about this population from the survey sample should be reliable.

Difficulties arose when we tried to compare the relative distributions of occupation categories between the ABS and the survey results. In spite of this there was sufficient similarity to be confident that this also indicates the reliability of the survey. This further highlights the difficulties within the industry of a clear schema for describing that ICT professionals actually do.

The comparison we arrived at is in the table below. Note the immediate difficulties of classifying. For instance managers appear in two separate categories in ABS publications; it is not clear which managers fall into which categories in the ABS classification.

Table C – Survey - ABS - Occupational Category Population Representation			
ABS		Survey	
Occupational Category	Population %	Occupational Category	Population %
Information Technology Managers	12.5%	Management	27%
Computing Professionals (includes system managers, designers, programmers, auditors, software designers, applications & analyst programmers)	46.5%	(In the survey Managers are not included in this group)	29%
Computing Support Technicians	12%	Technical support & Maintenance	8%

### 2.4.3 Questions

The survey questions were grouped into two kinds: demographic and substantive. In this section of the report we examine only the substantive questions and leave the analysis of the individual demographic questions for the appendix. Here we examine the substantive questions in relation to selected demographic questions.

The substantive questions were organized into five groups, Awareness, Perception, Regulation, Action, and Education.

#### 2.4.3.1 Awareness

We asked two questions concerning their awareness of ethics problems in ICT (Q. 13 and Q. 14). Q.13 asked about the respondents knowledge of the frequency of unethical behaviour and Q.14 gave a list of ethical problems and asked that they be identified according to importance.

#### 2.4.3.2 Perception

We asked two questions concerning their perception of the nature and extent of ethical problems within the industry (Q. 15 and Q. 16). Questions 15 and 16 asked if they thought that any group of ICT workers was particularly unethical (Q.15) or particularly ethical (Q.16).

#### 2.4.3.3 Regulation

We asked ten questions concerning their understanding of the existence of, and opinions concerning, the regulation of ethics within the industry. Schematically this has the following structure:

- Q. 17 If YES → Q. 18
- Q. 19 If YES → Q. 20
- Q. 21
- Q. 32 (Is) and Q. 33 (Ought)
- Q. 34 (Is), Q. 35 (Ought), and Q. 36 (Ought)

Question 17 asked if the respondents knew of any ethical regulations in ICT generally and question 18 asked the respondents to list them.

Question 19 asked if the respondents knew of any ethical regulations in their workplace and question 20 asked if they were effective.

Question 21 asked the respondents if personal ethics were sufficient for work.

Question 32 asked the respondents how important were ethics regulations in their workplace and question 33 asked how important ethics regulations ought to be.

Question 34 asked the respondents, for ethical matters, if they thought that ICT could self-regulate, question 35 asked if ICT ought to regulate itself, and question 36 who ought to regulate ICT.

#### 2.4.3.4 Action

We asked seven questions concerning their ethical action taking. That is, what did the respondent think and actually do when faced with ethical problems. Schematically this has the following structure:

- Q. 22
- Q. 23 If NO → Q. 24
- Q. 25 (request to act) which is closely related to Q. 26 (observation)
- Q. 27 If YES → Q. 28

Question 22 asked if the respondents would speak up if they saw an unethical act at work.

Question 23 asked if the respondents had ever spoken up over what they thought was an unethical act at work and question 24 asked if they did not, what reason did they have for not speaking up.

Question 25 asked if the respondent's job security would affect their reaction to a request to *do* an unethical act at work and question 26 asked if their job security affected their reaction



to merely *observing* an unethical act at work.

Question 27 asked if the respondents had ever actually been asked to do something unethical at work and question 28 asked if they did it.

### 2.4.3.5 Education

We asked two questions concerning the Ethics Education of ICT workers. That is, what is the nature of ethical education that ICT professionals received?

Question 29 asked if the respondents had any formal ethics training or education. Question 30 noted that everyone has had some informal ethics training and asked if the respondents would like to mention any specific examples.

## 2.4.4 Results

As not all comparisons of the demographic and substantive questions could be examined in detail only a selected number were chosen. The demographic questions selected for a detailed examination were: Q.1 (Age), Q.2 (Gender), Q.10 (Location), and Q.5 (Education - Technical). Also selected for detailed examinations were Q.14 (Ethical Problems) and Q.29 (Ethics Education). Q.14 as discovering the most frequent ethical problems seen in the industry is central to the development of an integrity system. We also examined ethics education (Q.29) we believe that understanding the past state of ethics education of ICT professionals will go a long way towards understanding many of the other results, or, at least, put them into perspective. Finally, several miscellaneous relationships were examined. While all the detailed statistics for each of the demographic attributes selected are contained in Appendix A – Part 1 - Survey Details we discuss only those of greatest importance here. These are age (in the form of generations), gender, technological education, ethics problems, and ethics education.

### 2.4.4.1 Generations (Q.1 Age)

Generation Y responded quite differently when compared to the other generations across a number of questions.

Gen Y (compared with other generations) thinks that ethical regulations **ought** to be less important. Job security **did** make a difference to their reaction to requests to behave unethically: Gen Y was the only generation to say this. Given that Gen Y has been in the work force least it seems reasonable that this lesser amount of work experience implies worse job security and would make them less confident about standing up for their beliefs. Finally, Gen Y reported having more ethics education than all but Depression and WWII Babies.

There was a significant difference across the generations when asked if job security

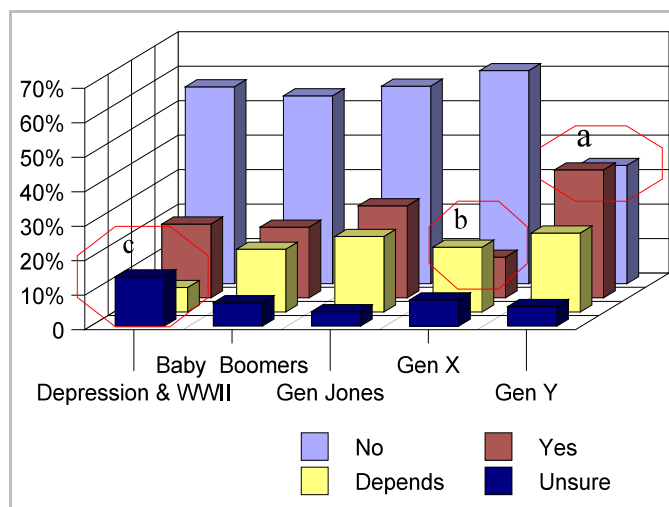


Figure 6 - Reaction to requests to behave unethically

made a difference to their **reaction** to requests to behave unethically (Q.1xQ.25): all generations but Gen Y overwhelmingly chose no over yes. Even then with Gen Y the difference was close:

- (a) the yes responses just outnumbered the no. The other generations had a wide difference between yes and no;
- (b) Gen X was the only generation where the Depends responses outnumbered the Yes;
- (c) The WWII and Depression generation was the only group where the Unsure responses outnumbered the Depends responses – they were the most unsure.

The result that job security making a difference to their reaction to being asked to behave unethically is at odds with the comment from Huntley that for Gen Y, “job security isn’t that big a deal”<sup>31</sup>. To Gen Y’s more generally Huntley reported that they are not particularly wedded to idea of work and a career; they see work more as a means to an end and something to support their other interests<sup>32</sup>. Further research would seem to be in order to undertake a reevaluation of these two contradictory results.

But why should this be so? Is Gen Y really different to the previous generations or, would the other generations have responded in the same way at the same time in their lives? In the in-depth interviews a Gen Y respondent commented that their generation were sceptical about the honesty and intention of older generations; that their generation has been brought up on deceptive and misleading advertising; that there is no security or reward in loyalty. They also said that Gen Y ICT professionals are more interested in the internet, networks and networking, and other social interaction phenomena as opposed to discrete systems development. If these observations are true of enough Gen Y ICT professionals then there is little to wonder in the fact that they are different. However, in spite of these poor examples as role models, according to Huntley, “young people still have the passion and the optimism and the desire to make a difference”. Further research is needed to determine the nature, extent of, and reasons for, the differences noted in the survey and in-depth interviews.

#### 2.4.4.2 Gender (Q.2 )

There were some important differences between males and females. When the ethical problems were grouped according to moral theory emphasis, males preferred duty and females preferred rights. Males believe ethical regulations in their workplace are significantly less important than females. Males (when compared with females) also believe that ethical regulations ought to be significantly less important. Females more strongly think that the industry ought to be externally regulated. There was no difference when it came to taking action. Finally, significantly more females than males reported having more ethics education. This is discussed in the section below dealing with ethics education (Q.29).

#### 2.4.4.3 Education - Technical (Q.5)

ICT specific technical education made a difference where those with ICT specific qualifications more frequently thought they would speak up but in fact did not do so compared to those without ICT specific qualifications. Also ICT specific qualifications made no difference to whether they would act on what they thought.

Disturbingly though, more respondents (83.3%) with ICT specific qualifications admitted to doing what they were asked even though they thought it was unethical when compared with those (75.5%) who did not have ICT specific qualifications.

Having ICT specific qualifications did make a statistically significant difference here. Those with ICT qualifications were less likely to say they would speak up than those without ICT qualifications. Note: the No and Unsure responses were all less than 2.7% and they have been excluded from the chart to the left. Does this suggest that ICT specific education is too narrow; is it just training rather than education construed more broadly?

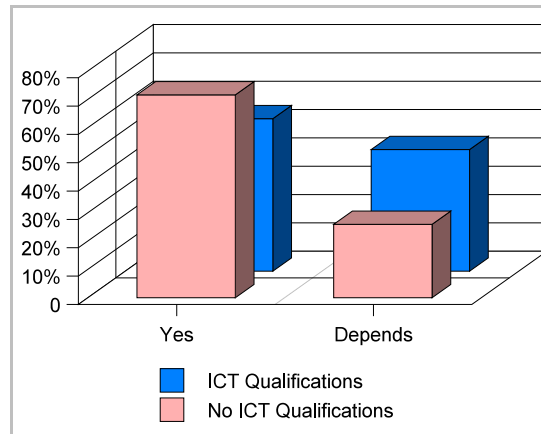


Figure 7 - Speaking Up

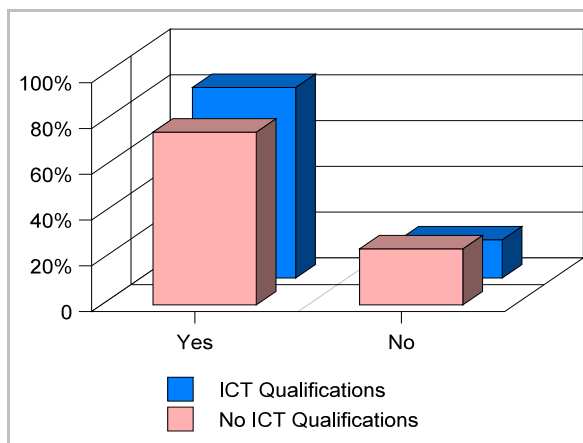


Figure 8 - Did you do what you were asked?

However when we asked if they had *ever* spoken up there was no statistically significant difference. While those without ICT qualifications more frequently thought they would speak up but in fact did not do so more often than those without qualifications. Additionally, having ICT qualifications made no difference in whether they would act on what they thought.

In the final question of this section we asked if they did as they were asked. Did having ICT specific qualifications make any difference to their answers? More people (83.3%) with ICT specific qualifications admitted to doing what they were asked even though they thought it was unethical than those (75.5%) who did not have ICT specific qualifications. Even so both numbers are disturbingly high.

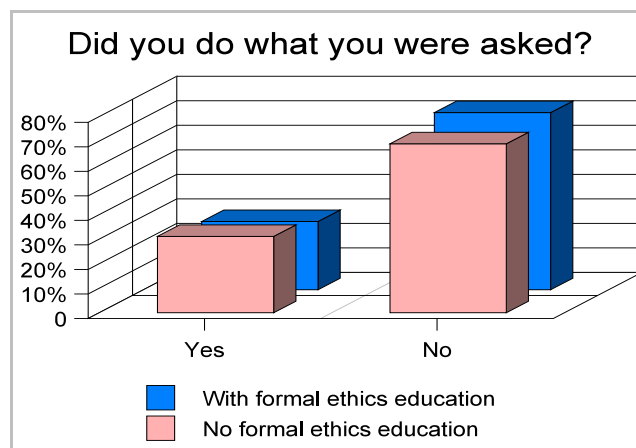


Figure 9 - Ethics Education and Acting Ethically

There was a slight difference with fewer of those with ethics education saying they did what they were told even when they knew it was unethical (27.8% did vs 31.1% did not) but the difference was not statistically significant.

#### 2.4.4.4 Ethics Problems (Q.14)

Contrary to expectations, work experience made almost no difference to the way respondents answered the survey (Q.14xQ.3). We thought that the longer one was in the industry the more one would experience a wider variety of ethics problems. This was not true. All levels of work experience encountered the same ethical problems.

There was no significant difference across the generations on their perception of how often unethical behaviour occurs (Q.1xQ.13). All thought that they occurred frequently. That any ethical problems at all become apparent almost immediately upon entering the profession is significant: Are the problems so pervasive and immediate that they are at the forefront of all ICT professionals daily work lives constantly?

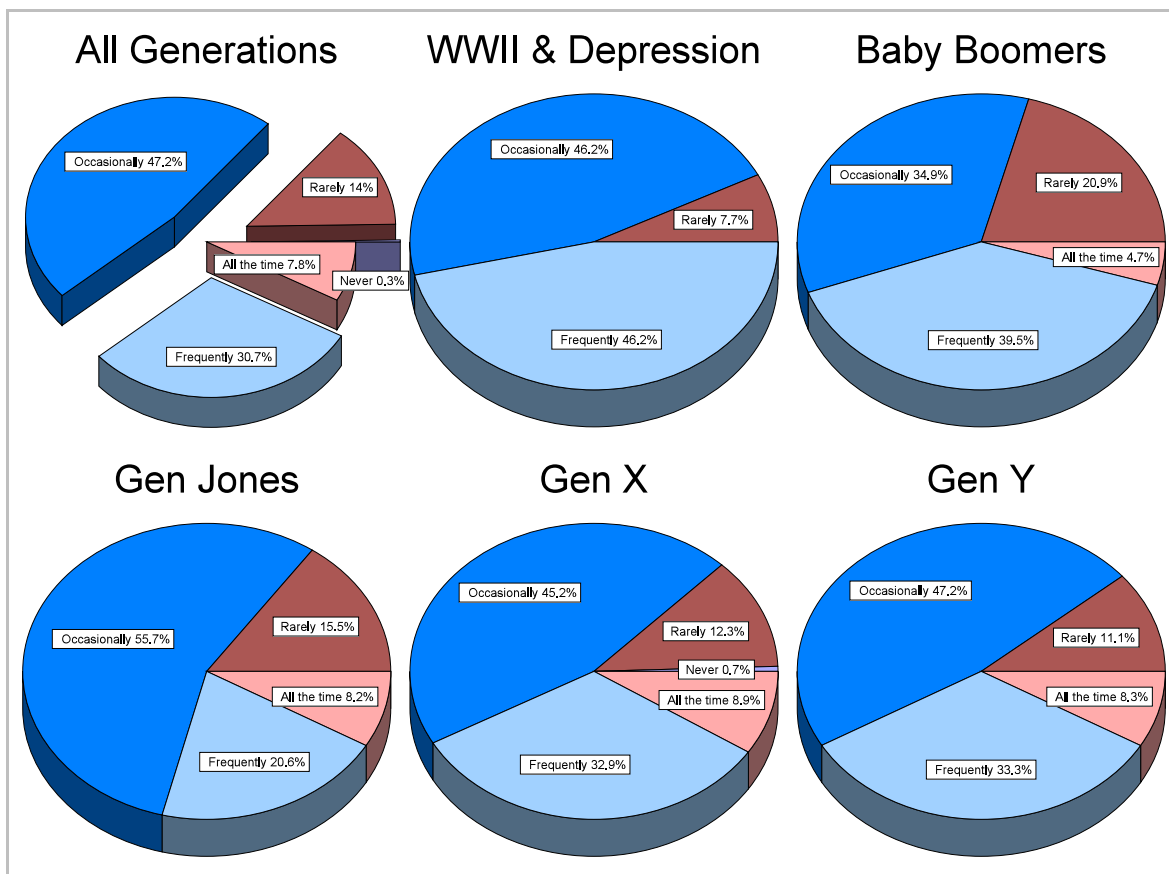


Figure 10 - Frequency of Unethical Behaviour

The rankings of the top five ethical problems are:

Table E - Top Five Ethical Problems								
	Compromising Quality	Conflict of Interest	Unprofessional Behaviour	Privacy	False Promises	Copyright	Malware, Viruses, etc.	Compromising Functionality
WWII and Depression	1	5	2	3	-	-	3	5
Baby Boomers	1	3	2	5	4	-	-	-
Gen Jones	1	1	4	5	3	-	-	-
Gen X	1	5	2	2	4	-	-	-
Gen Y	1	-	4	1	-	3	4	-

There is a high level of agreement across the generations about which of the fifteen ethical problems are ranked in the top five. There are only two interesting variations and these were chosen by Gen Y. Instead of conflict of interest and false promises, Gen Y chose copyright, and malware (societal as opposed to professional focussed problems) for their third and fourth most important problems. Further research is needed to determine the reasons for this small but important difference.

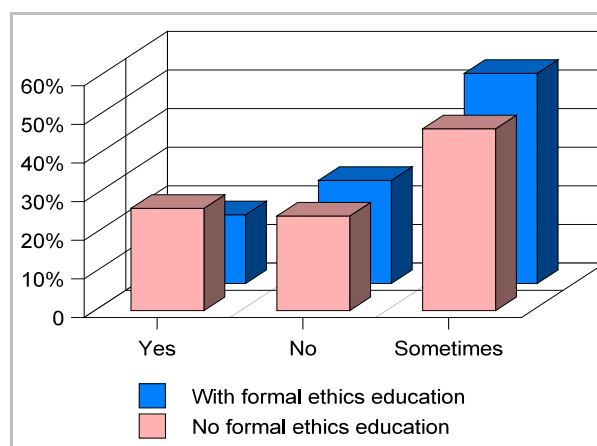
There were some interesting results when we examined the industry (Q.7) areas (private, public, academic). Private sector respondents chose consequence based problems (actions judged to be wrong based on the consequences of those actions) and public sector respondents chose rights based problems (actions judged to be wrong in themselves regardless of the consequences of those actions) while academics chose all three groups evenly. When examined by problem effect both private and public sector respondents selected professional emphasis problems while academics were, once again evenly divided between professional and societal.

However when we compared these results against the media exposure of problems in the ICT industry we found that there is almost no correspondence between what ICT professionals see as ethical problems and the problems that get the most amount of media exposure. There is a significant discordance between what the public gets to know about the ethical problems within the ICT industry and what ICT professionals experience in their workaday lives.

#### 2.4.4.5 Ethics Education (Q.29)

In summary ethics education made hardly any difference to the way respondents answered the survey.

There were two small, but statistically significant differences between those who reported having some formal ethics education (compared with those who reported having no formal ethics education). These were:



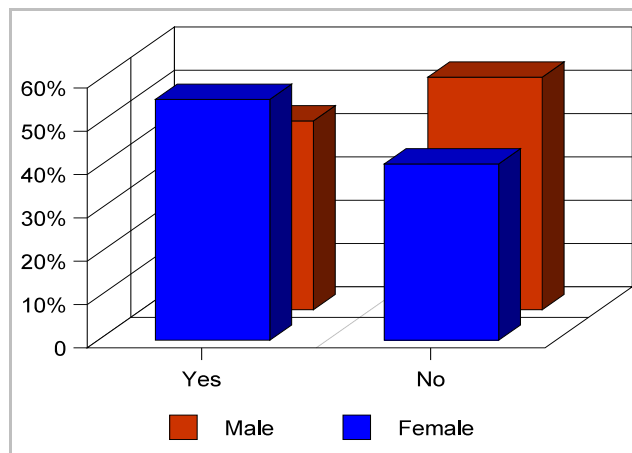
**Figure 11** - Ethics Education and Personal Ethics

- a) those with formal ethics education were slightly less likely to say that personal ethics were sufficient (17.8% with formal ethics education said no vs 26.5% without formal ethics education saying no) and
- b) fewer of those with formal ethics education said they did what they were told even when they knew it was unethical (27.8% of those with formal ethics education did what they were told vs 31.1% of those without formal ethics education did what they were told). While this is a positive result the difference was only just statistically significant.

We also cross tabulated ethics education against two further questions: *Would you speak up if you saw an unethical act* (Q.29xQ.22) and *Have you ever spoken up over an unethical act* (Q.29xQ.23)? There was no statistically significant difference between those with and those without formal ethics education on either of these two questions. This result was unexpected as it would, prima facie, seem that those with some formal ethics education ought to be more inclined (being armed with better tools for ethical discourse) to speak up. Is this even more evidence of the ineffectiveness of formal ethics education?

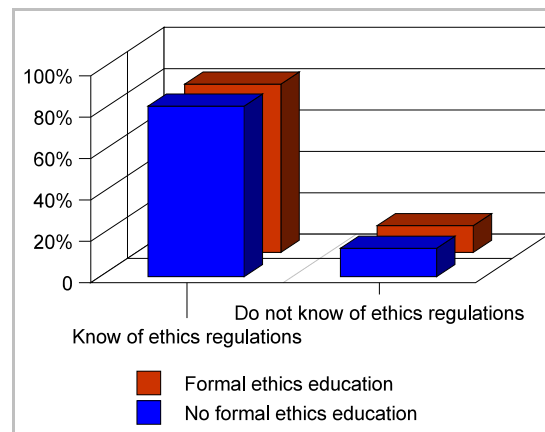
While there was a statistically significant difference between the genders when it came to their education/training about ethics, females reported more formal ethics education (53.6%) compared to males (43.6%), neither was nearly as high as it ought to be.

We did not ask if the formal ethics education respondents reported was compulsory or elective. If they were elective then this may account for the discrepancy. Another possibility is that females sought out formal ethics education and males did not.



**Figure 12 - Gender and Formal Ethics Education**

As a general observation, the number of both genders reporting having had formal ethics education is especially poor considering that three-quarters of the respondents claim to have ICT specific qualifications and since all but one of the 38 Australian universities is ACS accredited (this certification comes with it a compulsory ethics module). There needs to be a much more detailed investigation into the structure, content, an delivery of ethics to the ICT-professional-in-training.



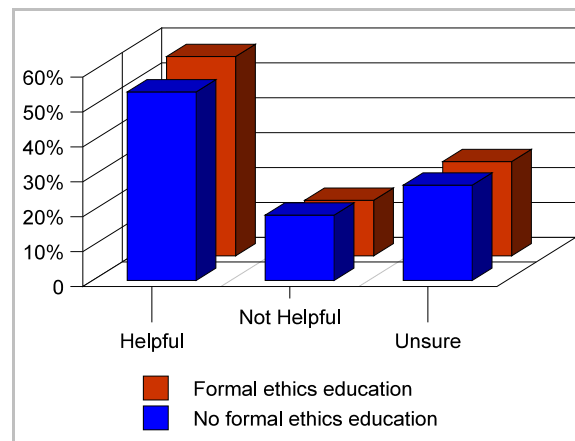
**Figure 13 - Formal Ethics Education and Knowledge of Ethics Regulations**

Finally, for formal ethics education we looked at the relationship between education and ethics regulations.

Formal Ethics Education and Knowledge of Ethics Regulations			
Formal Ethics Education	Do you know of any ethical regulations?		
	Yes	No	Unsure
Yes	81.3%	12.9%	5.8%
No	82.4%	13.7%	3.7%

There is no difference between those that have formal ethics education and those that do not when it came to knowing of ethics regulations. Both groups knew of some. While not statistically significant those without formal ethics education more frequently reported knowing of ethics regulations.

Formal Ethics Education and Helpfulness of Ethics Regulations			
Formal Ethics Education	Are the regulations helpful/effective? Only those Q20 respondents who said Yes to Q19.		
	Yes	No	Unsure
Yes	57.1%	15.9%	27.0%
No	54.0%	18.7%	27.3%



**Figure 14** - Formal Ethics Education and Helpfulness of Ethics Regulations

There is no difference between those that have formal ethics education and those that do not when it came to knowing of ethics regulations. Both groups knew of some. While not statistically significant those formal ethics education more frequently reported knowing of ethics regulations.

#### 2.4.4.6 Ethics Regulations (Q.19 and Q.20)

As the results of formal ethics education making a difference to knowledge and helpfulness of ethics regulations were disappointing we examined the survey results for the two questions on knowing and helpfulness of ethics regulations individually.

While more than four out of five knew of some ethics regulations, only half of those said that these were helpful or effective. This means that, at best, 42.6% of ICT professionals had something good to say about ethics regulations. This is a disappointing but not surprising result. Anecdotally, we suspected that a good number of ICT professionals had a poor opinion of codes of ethics but we did not anticipate the magnitude of the disappointment in such devices.

**Table W - Question 19.** In your workplace, do you know of any regulations that are supposed to address or prevent unethical behaviour? Regulations can be any known process, procedure, policy, guideline, legislation, or any other formal means of letting people know how to behave ethically. An example is a Code of Ethics.

Response	Number of Responses	Percent of Total Responses
Answered	348	98.3%
Did Not Answer/Missing	6	1.7%
Total	354	Percent of Answered Responses
Yes	285	81.9%
No	46	13.2%
Unsure	17	4.9%

**Table W - Question 20.** If yes to question 19, are they helpful/effective?

Response	Number of Responses	Percent of Total Responses
Answered	298	84.2%
Did Not Answer	56	15.8%
Total	354	Percent of Answered Responses
Yes	156	52.3%
No	54	18.1%
Unsure	88	29.5%

This might lead to the perception that the ICT industry does not currently value the ACS codes of ethics and its associated codes for professional behaviour. Clearly there is a need for the industry to value ethics.

## 2.5 Overview of the In-depth Interviews

Due to the limited and closed nature inherent in surveys, additional information was sought from selected ICT professionals in in-depth, qualitative, and open-ended interviews. In all, some 30 persons were interviewed by four interviewers; Yeslam Al-Sagaaf, Richard Lucas, Jeremy Moss, and John Weckert. Interviews took place in Canberra, Melbourne, Sydney, Adelaide, Hobart, Brisbane, and Wagga Wagga.

While a statistical analysis similar to that of the survey was not appropriate for the interviews and hence a direct comparison is not possible, we can make some general observations about the similarity of the two populations and what they thought about ethics in the ICT industry.

Demographically the genders are roughly in proportion to both the survey and the general population. Those interviewed had slightly more experience in the industry when compared to those in the survey. In the interviews three of the five generational groups (Depression and WWII Babies, Baby Boomers, and Gen Y) are proportional to the survey. Depression and



WWII Babies are under represented in the interviews (and the survey). This is because this generation is more likely to be no longer in the workforce. In both the general population and in the interviews, Gen Jones is significantly over represented and Gen X is under represented. When it came to occupations only consultants and administrators are roughly equally represented in both the survey and interviews. Managers and academics are over represented while developers are under represented in the interviews those interviewed had a greater average number of formal ICT specific qualifications compared with those in the survey (2.0 vs 1.2 per respondent).

### 2.5.1 The substantive questions comparison.

When asked about ethical problems those interviewed added many more problems when compared with survey respondents. These are: coercion, equality, promising, respect, temptation, freedom, leadership, loyalty, and power. This is an expected result; given the extra time to prepare for the interview and think during the interview we anticipated that the interviewees would have thought of more problems. Even with the difficulty of ranking the ethical problems (the small number of interviewees) there was a large agreement by the interviewees with the survey. Three of the top five ethical problems occurred in both lists.

The following two tables show first, what the interviewees' consider to be the important ethical issues in the industry, and second, a comparison between the survey and interviews on the important issues.

Table Xc - Interview – Industry Ethical Wrongs			
Notion		Number of Comments	
Professionalism		18	
Deception/Honesty		9	
Project Management		7	
Responsibility		7	
Quality		6	
Ownership		5	
Security		5	
Informed Consent		4	
Harm		3	
The following problems each elicited two comments			
Coercion	Equality	Promising	Respect
Temptation			
The following problems each elicited a single comment			
Conflict of Interest	Freedom	Leadership	Loyalty
Power			

In a comparison between the survey and the interviews of the important ethical issues we have the following table:

<b>Table Xd - Interview – What ethical issues have you faced at work in the ICT industry? How important?</b>				
Ethical Issue	Survey		Interviews	
	%	Rank	%	Rank
Unprofessional Behaviour	49.3%	2	29.6%	9
Privacy	45.3%	3	37.0%	=4
Surveillance	17.7%	13	37.0%	=4
Phishing	15.1%	14	37.0%	=4
Conflict of Interest	41.9%	5	33.3%	=7
Compromising quality to meet deadlines	54.4%	1	40.7%	=1
Compromising user requirements to meet deadlines	29.6%	7	40.7%	=1
False Promises	44.4%	4	40.7%	=1

**Note:** Only the top five responses from each of the survey and interviews have been included here. The full tables are contained in Appendix A – Part 2 In-depth Individual Interviews.

### ❑ Professionalism

The issue of professionalism in general and ethical problems specifically related to professionalism are clearly of extreme importance to all of those interviewed, as illustrated by the comments below. There is evidence of a lack of professionalism in the industry and this is discussed further in the Discussion section (beginning on page [35](#)).

Comments: Clients demands vs IT professional's duties (which are ill defined).  
 IT professionals need a well developed sense of responsibility for producing quality systems.  
 No control over participation in the industry. Lots of money in the industry.  
 Disconnect (mostly due to pragmatism) between technology and business and used for own benefit.

### ❑ Academic/workplace mismatch

In many professions there is a clear path from study to work. Also it is clear that this path is the only way to work in that profession, e.g. medicine. To some, that this is not true for ICT weakens the case for ICT being a profession.

Comments: perfectly good IT people come to the industry from many sources, not just with specific qualifications (this is different to many other professions). You then get the situation where people feel any one can do IT; that IT should be simple so anyone can do it. This turns a profession into a commodity. Computing has been seen as a way to make money and then leave.  
 Problems with vendors. Only interested in money.

## ❑ **Honesty**

Problems with honesty arise in a variety of contexts and are particularly, but not exclusively related to sales.

- Comments: There is also the software that is a free product offered but (hidden) charges for support.
- Adding to all this is a wide variety of licensing variability, so that for one manufacturer you can copy a product, but for another you can't. This gets more interesting when they subsequently change their policies; a good example here is around home use agreements (these work lovely to get initial market presence, but are less desirable when you have "lock-in").
- Another issue arises when you have faulty products - this tends to lessen the bar for ethical behaviour.
- A similar thing happens when people think they are paying too much for something that is proving not to live up to its claims.
- Misrepresentation. This affects every company and every level. Starts with sales pitch - misrepresentation by company of skills, capability, delivery, reputation. Clients also make it seem that there is more work than there is. People turning a blind eye to things and unprofessionalism generally.
- Salesmen sell IT products saying the products will do such and such when they do not
- Other problems include not delivering value for money and overselling. Sales people sell things to clients that they do not need.
- Supplier not communicating to clients the possible existence of problems with the work they did for them.
- The supplier is often not being completely honest with clients about the faults with the systems.
- Lying about project deliverables.

## ❑ **Project management**

The problems mentioned here are not so much the lack of competence of project managers but rather questions regarding their honesty and professional attitude.

- Comments: Poor Project Management.
- Project Managers start with malice aforethought.
- Get money for kudos, spend regardless.
- Don't look at what they are to deliver.
- Driven by the request – complying with requests exactly.
- Too many projects
- Not giving information upfront about how much the project will cost.

## ❑ **Responsibility**

Responsibility is very much part of professionalism and the comments here reflect the disquiet with regard to the general level of professionalism in the ICT industry.

Comments: People don't take responsibility.  
Suppliers not delivering/prevaricating on things so as not to take responsibility.  
Outsourcing diminishes responsibility

## ❑ Quality

The quality of products, service and advice is obviously also related to professionalism, and a number of the comments here highlight a concern that the compromise between quality on the one hand and cost, profit and time on the other is often not resolved in an ethical manner.

Comments: Clients spend less money on the development of products i.e. tight budget. This occurs a lot  
The level of disclosure with clients about, for example, how well a patch will fix a fault is not up to a good standard. There is also the issue of the supplier not giving them a quality response to their queries in relation to a product or a service.  
The clients are often naive about the complexity of the software or what sort of quality product the supplier gives to them.  
Money, time constraints and work pressure because of many projects (conflicting priorities) makes the developer sometimes act unethically. Sometimes there is no time to put the product in a perfect shape.  
Managers put pressure on people to submit the product before it is completely finished. When you identify a fault there is another that pops up but managers do not want developers to spend too much time on them and always demand them to submit the product to the client ASAP.  
There is also pressure from the client on the developer to develop systems that will generate revenue even if it is at the expense of the customer. Sometimes that puts the developer in a dilemma or makes the developer violate an ethical standard. The clients often want to make money so they ask the developer to develop the software with that objective but the customer is always the one disadvantaged

## ❑ Ownership

Problems of intellectual property are much discussed, but an under-explored area is that of ownership of software or methods developed for an employer when the employee who developed it is employed elsewhere.

Comments: Ownership of information is unclear.  
The biggest problem area is IP because it is a grey area. Supposed a particular method was developed for a particular client, sometimes that method ends up being recycled and given to another client. So what you did for one client goes also to another. But some can say it is their own IP. If we have developed a set of methodologies for a portfolio management for a client, why can't we use some of that stuff and give it to someone else?  
So I think people have a general understanding about this matter but do not see it as wrong. The IP thing is the ethical issue that keeps occurring.  
Another example is people installing software on department computers whether the department has a license for it or not. The department has a policy

that states only approved software maybe installed but that does not happen all the time.

People leave organisation and take software they have developed with them.

## ❑ On the ACS

As the industry professional group with the greatest membership, and hence the defacto professional representative organization it is instructive to know what the respondents had to say about the ACS.

From the point of view of the ACS there is a disturbing view that it is not relevant to the industry. The comments below do not so much reflect the views of those interviewed but rather their perceptions of what many in the industry believe.

- Comments:
- There is a lack of a professional society with any authority
  - ACS is not perceived to be an industry body like CPA (accountants). ICT needs a relevant, effective professional body.
  - ACS needs to become more relevant.
  - ACS is so-so for education.
  - Used to be a member of ACS, but they weren't effective and didn't do anything for me. Joined because of a speaker I wanted to hear. Membership too expensive for what was received. Does not involve real people the way SAGE does.
  - A colleague was refused entry to ACS because he did not have a degree. I don't have a degree either. ACS a bit elitist
  - Perception – ACS is too elitist, doesn't offer enough. This is not professionalism. Most IT people do not want to be professional and hence the ACS does not appeal.
  - The ACS is perceived by some to be trying to boost itself up through these kinds of projects.
  - Disappointed that no-one in industry takes ACS seriously, apart from the ACS.
  - The ACS can be pompous and exclusive. Not regarded as industry body.
  - Do not put the ACS logo on card, as it is seen as negative or not recognized.
  - Look to Microsoft certifications instead.
  - Needs to be like CPA.
  - ACS needs to target companies, businesses more to show benefits of ACS membership regarding professionalism
  - Needs a strong professional body for all aspects of professionalism.

## 2.6 Summary of Ethics Education Research

There are 38 universities in Australia and 37 of these have qualifications accredited by the ACS. All of these are certified has having courses covering Ethics/Social Implications/Professional Practice, a mandatory requirement for ACS certification. While not accredited by the ACS (perhaps something the ACS should investigate), the TAFE sector which provides ICT training has, in their training programs, two compulsory competencies which have ethics as a primary concern.

We found some reference to ethics (or, more widely, societal concerns) in the subjects or courses of all but one of the accredited universities. Additionally, we did not find any reference to ethics

(or more widely societal concerns) in the only non-accredited university. This means that 36 of Australia's 38 universities (95%) indicated on their websites that they delivered material related to ethics. Additionally, the survey reported 76.7% and the interviews report 82.1% of the respondents as 22 April, 2008 having ICT specific qualifications. On this we should have expected that, at the very least, 72.8% of respondents of the survey ought to have received some formal ethics education

This does not tally with the results of our survey however. Only 44.8% of the survey respondents and 39.3% of those interviewed said they received any sort of formal ethics education.

While it is true that some of the qualifications were gained overseas (for example 7.1% or two of the 28 interviewees) these would have to comprise nearly two-thirds (65.6%) of ICT qualifications to account for the difference. This seems implausible but would need further research to determine the precise difference.

Perhaps this could be accounted for by some of the respondents having TAFE qualifications? Of the 50 TAFEs throughout Australia only 16 (32%) reported covering the privacy competency and only 20 (40%) reported covering the ethics competency. While these numbers are lower than for universities it still does not account for the discrepancy found in the reported formal ethics education<sup>33</sup>.

As reported in the overview of the survey above even, where the respondents received some formal ethics education the education they received makes little or no difference to how the ICT professional experiences and reactions to ethical problems in the workplace.

## 3 DISCUSSION

### 3.1 Education: the survey and courses

This section discusses three issues: a possible mismatch between what is taught in ethics courses with the main ethical problems in the workplace, the place of ethics in ICT curricula, and optimal qualifications for those teaching ethics courses.

#### 3.1.1 General ICT Education

The survey suggested that formal qualifications in ICT did make a statistically significant difference in ethical behaviour in one area (see page 23), unfortunately it was not in the direction that we would have preferred. Those with ICT qualifications were more likely to do what they were asked to do something unethical. One possible reason for this is that ICT education may be very narrow; it may be that it is merely training rather than education. Perhaps there is a technical emphasis in ICT qualifications that reflects a lack of a professional attitude and the subjects are seen as purely vocational training.

#### 3.1.2 Ethics Education

##### 3.1.2.1 Efficacy of ethics education

Despite the fact that many (though not all) of those interviewed for this project expressed strong support for ethics education, as we noted earlier, the survey suggested that ethics education as part of an ICT course appeared to have no positive effect on the ethical decision making or ethical behaviour of those working in the industry. This view of the efficacy of ethics education is supported, if somewhat ambiguously, in the literature. Only one paper was found that looked directly at the ICT situation (Sharma and Burmeister, 2004), and it found no significant indication of efficacy. A number of studies of business ethics courses also suggest that their effect is not strong in the business community and the same appears to be true of medical ethics courses in the medical area.

Before this rather bleak assessment of ethics education results in it being removed from ICT course curricula, three considerations should be kept in mind. First, there is evidence that, at least in the medical field, ethics training is important in making a contribution to policy. There is no obvious reason why this should not also be true for the ICT industry or organisations that employ ICT workers. Second, there is evidence that company ethics training programs are effective in the business field. Again this could hold for ICT companies. Third, there is some evidence that what is taught in typical ICT ethics courses in Australian universities might not be what it is most needed. This is explored in the section following.

##### 3.1.2.2 Ethics education in ICT

All courses accredited by the ACS must contain material with particular emphasis on ethics or that studies the ethical and social issues related to ICT. In an internet examination of all university courses in Australia we found such components in all but two universities. One result of our survey however was that studying these components in general made no difference to the ethical attitudes or behaviour of ICT professionals. In this section we compare what the survey

showed were the main ethical concerns with the typical content of accredited university courses and the contents of the most common texts used.

As could be expected, privacy and intellectual property issues were prominent but what could generally be described as professional issues, that is, issues where professionals must make work-related decisions, dominated. High on the list were compromising quality to meet deadlines, unprofessional behaviour, making false promises and conflicts of interest. Also significant were compromising functionality and requirements to meet deadlines. Unprofessional behaviour also figured large in the extra comments section. Typical concerns were blaming others for one's own mistakes, poor team contributions, awarding contracts without due process, overpricing and under quoting of time and overstating of skills. The issue of professionalism was also of major concern in the interviews and most of the same worries surfaced. A number of related new ones were also mentioned, of particular significance were responsibility and informed consent.

A survey of the material covered in courses suggested that the common topics covered were the standard ones of privacy, security, cyber crime, intellectual property, regulating commerce and free speech and a few others, with professional ethics being one topic but frequently left unspecified. The most common text mentioned is Michael J. Quinn, *Ethics for the Information Age*, so a reasonable assumption is that the topics covered in the text also form the basis of the courses in which it is used (and most other texts cover substantially the same material). Its one chapter on professional ethics covers the issue of whether software engineering is a profession, the software engineering code of ethics and codes of ethics in general, and whistle blowing. Notably, many of the issues raised in the survey and interviews are not explicitly mentioned either in this text or in the course descriptions. It does not follow from this that these topics are not covered but at least it raises the question of whether the focus of ethics courses is on the most important issues. While the ACS does require the ethical component to be covered in order for a course to be accredited it does not require that there be a discrete subject and it is clear that the most popular option for universities is for ethics to be part of part of other subjects. This reflects a debate regarding the best way of teaching ethics to ICT students. One school of thought is that there must be a discrete subject with rigorous assessment otherwise students do not take the issues seriously. The other view is that discussion of ethics should not be conducted separately because then students do not see it as an integral part of the profession. A leading advocate of this view is Don Gotterbarn. He argues that ethics education is much more effective if it is incorporated throughout the curriculum rather than being taught as a discrete subject or course, and second, that it not necessarily best taught by philosophers or theologians. His concern is not to denigrate a philosophical approach to computer ethics but it is rather to understand how best to ethically educate computing professionals. A related debate, also mentioned by Gotterbarn, concerns the teaching of ethics; by what sort of person should it be taught? On the one hand it is argued that it should be taught by experts in ethics and on the other hand there are arguments for it being taught by ICT professionals because they know what the real issues are and they have more credibility in the eyes of the students. In both of these debates there are good arguments on both sides.

### 3.1.3 Summary

Three issues then have emerged from the survey and the literature: there appears to be a mismatch between what is taught and what professionals see as the most important ethical issues; there might be a problem with the placement of ethics in ICT curricula and it may not be taught by the most appropriate people. We return to these in the recommendations (page [46](#)).



## 3.2 Codes of Ethics/Conduct/Practice

### 3.2.1 Implementing codes

It is important that the codes of ethics/conduct are not viewed as irrelevant documents that are signed off on but not integrated into an individual's decision making. There are several means by which this can be avoided. Firstly, the content of the codes themselves needs to be relevant to the industry. This can be achieved by researching the concerns of the professionals in the industry and finding out what kinds of ethical issues they need guidance on. These concerns may change, particularly in an industry like the ICT industry, and the codes should reflect these changes by being updated where necessary. A review mechanism can be put in place to make sure codes are operating effectively and remains up to date. Codes can also be given a trial by a variety of different industry professionals run before they are implemented to ensure that it is relevant and comprehensive. Secondly, codes will gain relevance through their endorsement by senior people in the industry. This requires them to refer to the codes, being seen to act in accordance with them, and being involved in implementing them. Codes also need to be distributed in such a way that they are easily accessible and usable. Making sure that people adhere to the codes requires that there is some guidance as to how they work, how to consult them, and where to take issues that may require further action. The contents of the codes and discussions about them can also be made publicly available and form part of industry reports. This helps to reinforce the role that the code plays in establishing the perception of an industry that takes ethical matters seriously.

Finally, codes need to be integrated into a wider integrity system that encourages their use. If companies or organizations in the industry implement training courses or inductions with an ethical component, examples of the codes should be integrated into them. Case studies can be developed that reflect individual clauses in the code and used to form the basis of discussions, meetings or training. The codes should be viewed as practical tools that can assist with autonomous, ethical decision making. The more often they are used as such, the more effective it will be as a mechanism for developing and supporting an ethical environment.

### 3.2.2 Value and efficacy of codes

There are many benefits of codes of ethics that are developed for ICT professionals. Codes of ethics motivate members of an association to behave ethically and inspire them because they “provide a positive stimulus for ethical conduct”. Codes of ethics also guide members through the ethical problems they face in their daily working life and educate them about what is acceptable and unacceptable in relation to their interaction with others. Codes of ethics can also be used to discipline members (if the code has teeth) by, for example, causing a member to be sacked from his/her job for violating the code of ethics (Tavani, 2007, p.101). In addition to these, Reynolds (2003) lists four more benefits of codes of ethics. According to him, codes of ethics improve ethical decision-making since adherence to them means that professionals will use a common set of core values and ideals to serve as guidelines for ethical decision-making. Codes of ethics promote high standards of practice and ethical behaviour because adherence to them reminds the members of their ethical responsibilities and duties in case they are tempted to compromise or go against the code amidst competing demands from self, employer, clients, and community. Codes of ethics also enhance the trust and respect from the general public because the trust of the general public is built on the expectation that a professional will behave ethically and adhere to the codes of ethics. Finally, codes of ethics provide an evaluation benchmark

because professionals can use them to self assess their behaviour at work (Reynolds, 2003).

On the other hand, there are several criticisms of codes of ethics that are adopted by ICT professionals. In his discussion of the criticisms of the codes of ethics for ICT professionals, Tavani (2007) notes that these codes of ethics, unlike the ones in the field of law and medicine, have no “teeth” in the sense that a violation of the code does not necessarily result in the termination of the employment, or indeed, suffer any punishment at all, of those who violate them. Furthermore, codes of ethics can be too vague, self-serving, inconsistent, unrealistic, unnecessary and incomplete because some codes of ethics are limited to only four traditional areas of concern: privacy, accuracy, property, and accessibility (Tavani, 2007). Next, codes of ethics do not tell professionals what to do when two or more principles in the code conflict with each other. Finally, codes of ethics can give professionals the mistaken notion that all they need to do is to locate a directive and then follow it blindly when they should have examined, explored, discussed, deliberated, and argued for or against a particular course of action (Tavani, 2007). In addition to the above, there are two more points of criticism against codes of ethics for ICT professionals. The first is that they can be too detailed, static and inflexible for this area that is very dynamic and as such needs a code that can easily be adapted. The second is that most of the codes are the product of the technological thinking in developed countries and so those who develop these codes tend to neglect the differences in cultural and social values (Berleur and Brunnstein, 1996).

The discussion above does make some useful points about codes, but it does not tell us if they in fact make any difference to behaviour. In a recent review Karen Mather (Mather 2007) looked at twenty-four studies of codes and found that while the results were indecisive, fifteen of those studies supported codes while nine were negative, equivocal or said nothing of their efficacy. Mather of course does assert that the numbers in themselves are strong evidence that codes do have an effect on behaviour, but considers what these studies say. Here we mention just a few that focus on empirical studies of the efficacy of codes. It must be noted that most of the studies involved codes of corporations and not of professional bodies. It appears that much more research has been done in this area. These studies are however still relevant and we comment on that at the end of the section.

Pierce and Henry (1996 and 2000) are positive about the efficacy of codes. In their first study they reported that 78% of respondents said that they used professional codes to held guide their ethical decision making, and in their second they say that “the results suggest that the organization is perceived as more disapproving of questionable actions by those computer professionals who work for organisations which have CT [computer technology] ethics codes” (319). They do make that obvious point though, but one that can easily be overlooked, that “in order for the codes to be effective, the organization must communicate the codes to the members and make the membership aware of the philosophy embedded in the codes” (1996, 427). Similar findings are reported by Adams, et al (2001): “This study found the existence of a corporate code of ethics affected both employee ethical behaviour and perceptions of ethics in several ways. Respondents who worked for companies having a code of ethics judged subordinates, co-workers, themselves and especially supervisors and top managers to be more ethical than respondents employed in organizations not having a formal code of ethics”. Furthermore they say that “Our findings suggest that the mere presence of a code is more important than the content of the code per se”. This latter comment is interesting in the light of criticisms that say that codes are in general too vague to be useful.

Not all research, however, has led to positive conclusions. Cowton and Thompson (2000) claim that, while there were some differences in ethical behaviour between the banks that they studied,

none were statistically significant different: “the findings fail to provide firm support for those who would claim that codes have a substantial impact on business practice”. (173). Snell et al (1999) report interesting findings on a study in Hong Kong: company codes of ethics have a positive impact on the conduct of employees and on the image of the company but not much on relationships between staff or between staff and suppliers and clients. In another study reported in the same paper, no differences were found. Only weak and qualified support was also found by Harrington (1996). Generic codes, as opposed to specific IS codes did have an impact on those who normally have a strong tendency to deny responsibility, but IS codes has less impact and neither had much impact on those more willing to accept responsibility for their actions. Finally, Pearson et al (1997) reported two findings of some concern. First, “The results ... provided very little support for the idea that IS managers are guided by the ethical codes of conduct put forward by the IS professional associations.” (95) and “The IS profession should also be concerned by the apparent lack of commitment to respondents proclaim for professional associations ... This raises an interesting question about the role and/or effectiveness of these organization in the development of ethical standards for the IS profession.” (99).

The somewhat ambiguous results from these studies are supported by our survey. When asked if they were aware of regulation, including codes of ethics, designed to prevent unethical behaviour, just over 80% answered yes. However, when asked if these were helpful or effective only a little over half agreed that they were while around 30% were unsure. (questions 19 and 20).

### 3.3 Certification and Licensing

Certification and licensing of ICT workers has been much debated over the last decade and more. Debates about the licensing of software engineers have been the most vigorous. The issue has frequently been raised but just as frequently attacked, and implemented only in very few places. The ACM, after considering it came out against the idea in 1999.

Before proceeding, it is worth distinguishing between certification and licensing. A person is certified as being a qualified member of an occupation if, typically, he or she has satisfied certain requirements considered necessary for that occupation, for example, has passed particular examinations. According to Underwood (xxxx), “Certification is a means of providing information to the public to facilitate choice between competing services offered on the market” (7). While certification indicates that a person has certain skills, someone without certification can still practice. Licensing is stronger and carries legal weight. In occupations where there is licensing, a licence is necessary to practice legally. In the ICT industry, discussion of licensing have generally been limited to software engineering and not applied generally.

We now consider some of the common arguments against the licensing of software engineers and argue that these criticisms are, in general, not valid, although some genuine are raised. Here we focus on a number raised both in the ACM document and particularly by Tony Healy in response to an ACS proposal.

The main objection seems to be that software engineering is relatively new and there is not yet a recognised body of standard professional knowledge that all must have. According to Healy the ACS definition of this knowledge was based on the contents pages of outdated textbooks, and more importantly, the practice of software engineering differs significantly from what is in the text books. These might be telling criticisms against a particular definition of the “standard professional knowledge” and of the textbooks commonly used in courses. They do not show

however, that there is no such body of knowledge. There is the substantial worry of course that perhaps there is no body of knowledge, although this is disputed. Underwood, for example sees no problem here, citing standard syllabi being developed (13).

Another argument is that licensing would hinder innovation. Perhaps it could but it need not if it were flexible and it could have the benefit of making people think about the innovations that want to introduce. Not all innovations are good. There continue to be innovations in medicine and plumbing even though there is licensing in both.

Licensing would exclude people from backgrounds outside of computer science and currently, according to Healy, about 50% of software developers come from other disciplines. It might be bad to exclude them but it might not in all cases. Insisting that a mathematician, architect or art historian had some basic knowledge of software engineering before being allowed to practice is not obviously a bad thing.

It is claimed too that “the ACS does not provide any evidence that licensing works”. It is of course not easy to show that licensing works in the case of software developers. There are hardly any such developers who are licensed. But there are some in the USA so a comparative study could be undertaken and probably should be. It is not true though that there is no evidence of the value of licensing or some form of certification in general. Doctors, lawyers, accountants, engineers in general, builders, plumbers, electricians and so on all must satisfy some certification requirements to become licensed, and these seem to work.

Finally there is the objection that certification “would expose software developers to malpractice suits”. This in itself is no objection. All of those groups listed above are in this position. Software developers are the odd ones out. The objection does get some teeth if there is not satisfactory way of defining the necessary body of knowledge, but it is not obvious that there is no satisfactory way. This objection is expressed also by Knight and Leveson (2002), who believe that currently (or in 2002) professional standards for software engineering are not yet clear enough to make “best practice” easily decidable.

Currently the ACS is working on an international certification for ICT professionals, which could including certifying professionals. While certification is weaker than licensing, some argue that many of the same problems arise (Knight and Leveson 2002). Undoubtedly therefore this effort will be scrutinised carefully, but given the ubiquity and importance of ICT today, licensing and certification should not be dismissed too readily.

### 3.4 The ACS, Professionalism and Professional Responsibility

There is some evidence that many in the ICT industry do not see themselves as professionals and have no interest in seeing themselves in this way. In one sense this might not matter but in another it might. In order to see why it might matter, we briefly outline a standard way of considering professions.

The professional role that an individual occupies often provides a context for our ethical judgements. The same action—for example, providing information that will help out a legal case, shooting someone, or having a relationship with a client—may invoke very different moral reactions depending on whether the person involved is a police officer, hairdresser, psychologist, lawyer or teacher. It appears that someone's professional role can provide either exemptions

from, or additions to, what we might consider to be ordinary morality.

The term ‘profession’ has a variety of uses. It is often taken to refer simply to a person’s occupation, and so a profession in this sense encompasses everything from shop assistant to neurologist. The term ‘professional’ is also used to signify a person that has widely recognized certification, including qualified accountants, engineers and veterinary scientists. However, in an ethical sense it is used most often to apply to roles that fulfill certain criteria. The sort of roles that these criteria apply to is not necessarily a clearly bounded set. Rather, the criteria provide a guide as to the kinds of characteristics that generally accompany such professional roles.

The criteria that are often used to distinguish professions are –

- a) The need to master a special, esoteric body of knowledge. This body of knowledge is usually obtained through higher education—for example, a degree in psychology—and is required in order to practice the profession.
- b) Some amount of autonomy for both the profession as a whole and the individuals in it. Professionals have the autonomy to make decisions in their daily work, justified by the fact that they are experts based on their training. So, for instance, a lawyer will have the autonomy to decide on the best way to defend their client, as opposed to taking orders from some higher authority. This autonomy also extends to the profession as a whole. The profession regulates itself, making decisions about who is able to enter it and what standards they should be held to. It will generally be able to do this with little government interference.
- c) Connected to the autonomy of professions as a whole is the existence of a formal organization. A profession will usually be governed by a unifying body that is recognized by the government—for example, the Australian Medical Association (AMA). This body may have several roles, such as setting standards for certification and having the authority to expel members from the profession.
- d) A profession will also generally have a code of ethics that both sets the standards of behaviour for its members and also signals to members of the public what to expect when they engage the services of a professional. For example, medical professionals are usually taken to be governed by the general principles of beneficence, non-maleficence, autonomy and justice.
- e) Finally, professions are typically understood to fulfill a social function. This will be often be connected to a social good, such as health or justice, or be concerned with more general social benefits, such as providing the technologies and infrastructures to enable society to function effectively. In general, the idea is that professionals serve the interests of the public. So, for instance, the role of the lawyer is to promote justice, the role of police is taken to be the provision of security, and the role of engineers as the provision of technologies that enable things such as communication and transportation.

Some of the comments from the interviews suggest that there is not a strong commitment from all ICT workers to professionalism. While only one comment states explicitly that “most IT people do not want to be professional” there are other statements that the ACS is elitist or exclusive. Professions are by their nature elitist and exclusive – only certain people satisfy their requirements. This suggests that there is a view that there is not, or should not be, anything elitist about the ICT industry. The fact that there is vigorous discussion regarding licensing and certification in the industry suggests a view that ICT is not considered a profession by a substantial number of those employed in the industry. This is particularly apparent in the argument that there is no accepted body of knowledge in ICT, something that is one of the

definitive aspects of other professions. There is support for this claim in the literature.

Does it matter if people in the ICT industry do not see themselves as professionals? There is at least one reason why it should give pause for thought. Professionals have special responsibilities, considered as professionals, over and above the responsibilities that we all have. A professional medical doctor, for example, has the responsibility to provide health care, and “the role of the lawyer is to promote justice”, as we saw in e) above. We all have some responsibility as citizens to assist others with respect to health care and justice, but not to the degree that doctors and lawyers do. There is the worry therefore that perhaps the sense of responsibility is not as strong as it should be amongst ICT workers. This is reflected in many licensing agreements of shrink-wrapped software and in one of the arguments against accreditation of ICT workers where it is pointed out that such accreditation would, or could, make the workers accountable.

### 3.5 An Integrity System for ICT

The survey, the interviews, and the literature together suggest that ethical awareness in the ICT profession requires some strengthening. The current mechanisms, while useful, need to be incorporated into an integrated system. A proposal for doing this is described in detail in Appendix B, however broadly speaking, this integrity system is a set of mechanisms aimed at ensuring the greatest penetration of ethical thinking, ethical decision making and ethical action into an organisation. It is envisaged that variants of this integrity system could be incorporated into particular organisations and businesses that employ ICT professionals, whether those organisations and businesses are primarily ICT focussed or not.

This integrity system needs to contain;

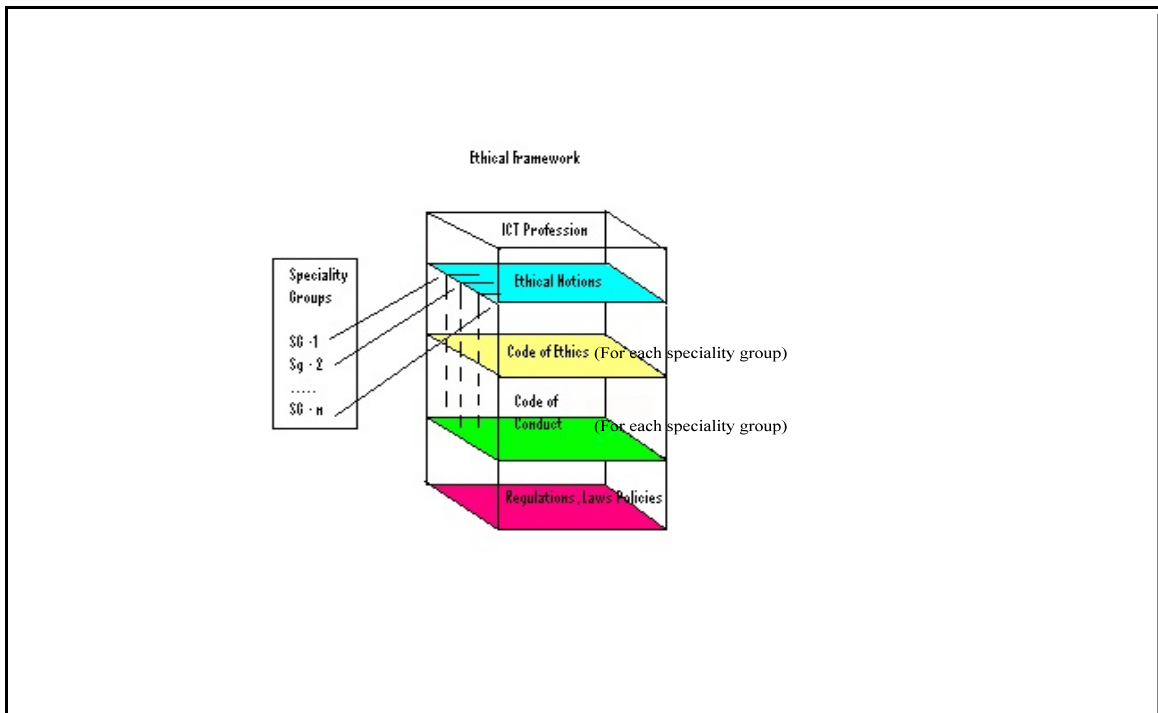
- 1 an ethics framework,
- 2 prevention and resolution techniques,
- 3 integration methods, and
- 4 management tools.

These will be discussed in the sections following.

#### 3.5.1 The Ethics Framework

The ethics framework (infrastructure) contains; a definition of the ICT profession, an ethical concepts priority ranking scheme, and tailored – codes of ethics, codes of conduct, and regulatory mechanisms.

By way of example we present an ethics infrastructure diagram here:



**Figure 15** - Ethics Framework

### 3.5.2 Prevention and Resolution Techniques

The prevention and resolution techniques section contains; education and training programs (for both students and practising professionals), reviews, committees, helplines, audits, and penalty free whistleblowing. One reviewer recommended that an industry wide central agency be created to respond to questions around ethics and counsel professionals through challenges if they are professionally compromised. Such an agency could be responsible for overseeing ethics audits on organisations.

- ▶ Note that ethics education is discussed elsewhere in this section and recommendations for it are made separately to the recommendations made for the integrity system.
- ▶ Ethics reviews need to be carried out (perhaps under the auspices of the ACS) examining the profession as a whole: they also need to be performed by each professional as a personal ethics examination.
- ▶ Ethics committees need to carry out preventative programs and use resolution plans where needed.
- ▶ Helplines have been used in other contexts with varying success but ought to be assess for appropriateness in this context.
- ▶ Ethical audits to measure the effectiveness of the ethics governance plans devised as part of the integrity system are an essential aspect of ensuring that the integrity system is active, engaged, and effective for ICT professionals.
- ▶ While whistleblower legislation exists those who do make public wrongdoing suffer serious life altering changes to their work and home life. The integrity system needs to acknowledge this and a culture of rewarding (not shooting) the messenger needs to be established.

### 3.5.3 Integration Methods

Integration methods are checklists to ensure that ethical considerations are placed in all decision mechanisms, policies, procedures, and education. For ICT this means including ethics considerations in, for example, project management, testing, risk management, analysis and design, implementation, user interaction, quality assurance, and maintenance.

### 3.5.4 Management Methods

The management methods required for the integrity system include:

- ▶ the assigning of responsibilities for maintaining the ethics infrastructure, monitor and review both the ethical performance of those within the scope and the effectiveness of the integrity system;
- ▶ taking action to ensure that the proper processes are followed in both the day to day use of the integrity system and in the invocation of preventative and resolution techniques;
- ▶ ensure that enough resources (people, information, etc) are available for the day to day use of the integrity system and in the invocation of preventative and resolution techniques; independent of audits of both the day to day use of the integrity system and in the invocation of preventative and resolution techniques; and
- ▶ the governance of the integrity system.

The management tools needed to carry out the above methods include:

- ▶ an Ethical Decision Support System;
- ▶ Ethics Impact Statement and Ethics Risk Assessment Statement;
- ▶ Ethics Priority Ranking Scheme;
- ▶ Ethical Conduct Review Procedure;
- ▶ Ethical Assessment in Employment Practices (to gauge the ethics of prospective employees and ensure ethical employment);
- ▶ Ethics Audit Procedures;
- ▶ Ethics Integration checklist; and
- ▶ Resolution Processes (to Repair, Restore, Recompense).

As examples we describe here the first three of these and leave the remainder for Appendix B – Integrity Systems, Part 2 – A New Integrity System.

An ethical decision support system is needed to assist those who find themselves with an ethical problem to work their way through the problem. Learning to effectively use this system should be part of the ethics education system.

An ethics impact statement ought to be prepared for each new proposed system. An ethics risk assessment statement is needed for all significant work done by an ICT professional to ensure that potential ethics problems are identified and ways of avoiding them proposed (for example the possibility that someone might seek to influence the outcome of a tender process for software selection).

An ethics priority ranking scheme is an essential component for developing targeted and tailored codes (of ethics and conduct). This is the mechanism that shows which ethics concepts are most important to the speciality groups.



### 3.5.5 Applying the integrity system to ICT

Applying the integrity system to ICT should be approached just as any other system would be: with a systems development focus. This means management, standards, governance, testing, QA, risk analysis: the whole panoply of tasks, procedures, and methods that exist in ICT. An approach we recommend is to tackle this from an information life cycle point of view. That is, from the inception of the need for information (normally known as user requests), through the whole systems development process (initiation, feasibility, systems analysis and design, building, implementing, and maintenance), and ongoing operation of the system.

There are a large number of texts and other guides (such as industry best practices) that prescribe how this is to be done and it is not our intention here to suggest which approach is best. An example of the use of a process to evaluate two current ICT professionals is given in Appendix B – Integrity Systems, Part 2 – A New Integrity System, Section I – Two Practical Examples. The second of these two examples points to the value in using a virtue ethics approach with imbedded regulative ideals. This can be an especially valuable where there is no particular organization and no specific work for an integrity system can focus on. The generic nature of virtue ethics can be a strength that an ICT professional can carry with them across a number of organizations, job positions, and work tasks.

## 4 Recommendations

The recommendations that we make here recognize (a) the diverse nature of the ICT industry with respect to occupational groups; (b) that ICT workers are employed in a wide variety of organizations and industries; (c) that there is no one body that has authority over the whole ICT industry; and (d) that while the ACS has influence in the industry, it has no authority to enforce the adoption of an integrity system for the industry. The recommendations are therefore recommendations to the ACS on ways that we believe it can enhance integrity systems in the industry and thereby improve both the professionalism of ICT workers and ethical standards in the ICT industry.

There are a number of important and interesting results from the work in this report. While all are deserving of either immediate action or further examination, individually, their chief importance is eventually to be a part of an integrity system integrated into information systems development and use. The preeminent result is the need for a new integrity system. It is this that is dealt with first here and which is followed by the remainder of the recommendations: those of immediate concern and those that require further research. First and foremost of these areas is what needs to be done now to begin to get better ethical thinking and behaviour. Finally, this report highlights areas needing further research which will aid in the better management of the ethical integrity system. Schematically the recommendations are as follows:

- ▶ A New Integrity System
  - Implementing the integrity system
- ▶ Immediate
  - Education
  - Low Profile of the Code of Ethics
  - Professionalism
  - New Integrity Software
- ▶ Research

### 4.1 A New Integrity System

A broad outline of this new integrity system was given in Section 3.5 A New Integrity System for ICT above (page 42) and a detailed examination is given in Appendix B – Integrity Systems, Part 2 – A New Integrity System. Neither is repeated here.

While the ACS has no authority over the industry as a whole it does authority over its members and is well placed to provide guidance to all those who seek to be ICT professionals. With this in mind we believe that the ACS has two tasks concerning a new integrity system; internal and industry wide. It should provide an integrity system that ICT professionals can use to assist them in their workaday lives. It should also provide a model for integrity systems which can be used to supplement, or be incorporated into, individual businesses or organizations that employ ICT people.

The difference between the two models lies in the difference between the professional *qua* professional and professional placed in a specific organization performing specific tasks. The professional *qua* professional has no context with which to determine if an ethical problem exists or is likely to occur. The professional placed in a specific organization performing specific tasks has detailed information with which to use perform several important tasks.

The professional *qua* professional needs to have prepared, before they enter any organization or perform any work, an integrity system which they can use to compare against organizational integrity systems as they encounter them. It also gives them the ethical tools with which to evaluate any tasks they are asked to perform. This allows them to be prepared for any environment in which they find themselves as professionals.

For the professional placed in a specific organization performing specific tasks knows to ask for (in an ideal workplace they would be given upon arrival) for the integrity system that has been developed. This, of course, implies that the organization has taken the integrity system model and applied its values to the ethics framework and ethics governance that is described in detail in Appendix B – Integrity Systems, Part 2 – A New Integrity System.

### 4.1.1 Implementing an Integrity System

It is imperative that integrity systems be implemented to ensure the presentation of ethics in the industry. Without this the demands for ethical behaviour will seem hollow, piecemeal, fragmentary, and arbitrary: just as they do now. Simply getting better ethics education on its own (another recommendation discussed later) will not deliver sustained and higher levels of ethical behaviour.

More work is needed to complete both the conceptual underpinnings of the integrity system and the detailed workings of the framework and governance processes that allow the integrity system to be implemented. An example of the detailed workings of the governance processes is the development of software that ensures that the integrity system is embedded in all systems development, maintenance, and production. This embedding almost certainly means creating integrity software. It seems almost impossible to imagine how this could be achieved manually without excessive cost of the professionals time.

### 4.1.2 Using an Integrity System

By way of example, we used information from the survey to determine an ethics notions priority ranking for the industry at large. The details of how this was done is contained in the following two sections.

#### 4.1.2.1 Mapping Occupations, Problems, and Ethical Notions

Frequently ICT professionals do not have a conscious awareness of the ethical notions that are most important in their work. As we did not know anything about the respondents in our survey we needed to take an approach that would allow us to derive the priority ranking of ethical notions. We took the ethical problems which have been identified by individual occupational categories and mapped them onto the general ethical notions (indicative examples of this are in Appendix A – specifically; Table W - Question 14a. Moral theory vs moral emphasis, the Q.14axQ.6 Moral Theory Focus\*Self-described Occupational Category table, and Q.14bxQ.6 Ethical Principal Focus (prof./soc.)\*Occupational Category table).

This then gave a priority ranking of the ethical notions (such as harm, justice, fairness, respect, accountability) and would allow tailored codes (of ethics and conduct) to be constructed for the individual occupational categories that have carried out the ethics problems ranking. Note that this mapping process would be aided by a coherent and systematic occupational structure but that such a structure, currently, is not available. It is our recommendation for further research

that such a structure be devised.

#### 4.1.2.2 Tailored Codes

If the above were done for a speciality group within the industry then the next step would be to create specifically tailored codes (ethics and conduct) for individual groups of ICT professionals. Such codes would be more appropriate to individual ICT professionals because they would be specifically constructed to emphasise the important ethical notions (and hence ethical problems) that professional is most likely to encounter in their workplace. These codes while tailored, would not be without all the fundamental ethical notions, rather each tailored code would emphasise these ethical notions differently.

Of course integrity software would greatly ease the burden of producing these codes. However we are not aware of the existence of any comprehensive offering<sup>34</sup>.

#### 4.1.3 Conclusion

More detail of how to use an integrity system in practice is contained in Appendix B – Integrity Systems, Part 2 – A New Integrity System, Section III – Two Practical Examples.

## 4.2 Areas of Immediate Concern

### 4.2.1 Education

The survey suggested that ethics education has little affect on ethical attitudes or on ethical behaviour. While further research would be required to understand why this is so, the survey and the interviews together with the examination of the content of courses that was conducted on the Internet, suggest that there may be a mismatch between what is taught and what the main issues really are for working professionals.

We recommend that attention is given to four issues:

- ▶ The Content of Ethics Components
- ▶ The Structure of Ethics Components
- ▶ Teachers of Ethics Components
- ▶ Ethics training courses for businesses/organisations

#### 4.2.1.1 The Content of Ethics Components

Professional issues, for example, software quality, were of most concern to those surveyed and interviewed but most ethics courses seem to concentrate on social issues. Given this, it is reasonable to suggest that more emphasis should be placed on professional issues. We recommend that the ACS considers this when accrediting courses.

#### 4.2.1.2 The Structure of Ethics Components

The Internet survey of the ICT courses showed that most did not have a discrete ethics subject but that the required ethics component was part of one or more other subjects. While this is not necessarily a problem and is often seen as the best way of introducing students to the ethical

problems, it can also be an excuse for not giving ethics a prominent place in the course. It can also suggest to students that, because there is no discrete subject with normal assessment requirements, ethics does not need to be taken seriously. We believe that the most effective structure is to have a discrete ethics subject which is then complemented by assessable ethical reflection in other subjects. Where this is not done we recommend that ethics be integrated into other courses, and that the ethical content and assessment be equivalent to a full subject.

#### 4.2.1.3 Teachers of Ethics Components

It is important that teachers of ethics have a good knowledge and understanding of both ICT and ethics. One possible reason for the lack of efficacy of ethics teaching in ICT courses is that those teaching it are competent in one but not the other, so that either what is taught is not ethically rigorous or not relevant. An ICT professional without ethics training will flounder when challenged in class and an ethicist without a solid background in ICT will be found to be not believable, not have the right kinds of experience to relate their theory to actual practice. We recommend that the ACS consider offering programs for teachers of ethics to supplement deficiencies in either area. Alternatively, we recommend that, where this is possible, ethics components are taught jointly by ICT professionals and ethicists.

#### 4.2.1.4 Ethics training courses for businesses/organisations

There is evidence in the literature that ethics training programs within organizations do have a positive affect on behaviour. We recommend therefore that the ACS develop ethics training course outlines or structures that can be adapted to the needs of different organizations and make these available to the organizations.

### 4.2.2 Low Profile of the Code of Ethics

There is not high awareness of the ACS codes and many do not see codes of ethics as relevant. The survey showed that awareness of codes in general is higher where those codes are part of the workplace; this is also stated in the literature.

We recommend that:

- 1 these codes be part of all ethics components in ACS accredited ICT courses
- 2 the ACS tailors its relevant codes to the various occupational groups
- 3 the ACS works with organizations to have the ACS codes accepted as codes for the organization, or have the ACS codes integrated into the organizations codes
- 4 there are procedures in place so that the codes are regularly reassessed to ensure their relevance
- 5 attention be paid to ensuring that such codes are a component in a whole of work-life integrity system (See A New Integrity System beginning on page [46](#)).

Codes of ethics would gain in importance and relevance with the support of the additional material that an integrity system would offer.

## 4.2.3 Professionalism

### 4.2.3.1 Lack of interest

Research has shown that there is a lack of interest by workers in the ICT industry in being seen as professionals or in ICT being seen as a profession. This might be the result of many different factors. It might be because the industry is so diverse, as can be seen from the large number of self-descriptions of occupations given in the survey, or because a large number of those in the industry do not have ICT qualifications. These two reasons might be partially overcome by the implementation of the previous recommendations but in addition we recommend that more emphasis is placed on publishing pieces on ethics in places that are widely read by those in the ICT industry (eg, *The Australian*, *Melbourne Age*, *Sydney Morning Herald*, and *Computerworld*); that ACS target management of organisations, particular large ones, to raise the profile of the industry as a profession; as a high priority address the issue of why there is so little interest in being considered a professional.

### 4.2.3.2 Professional certification

In most professions, and in many trades, people must pass some certification procedure before they can practice. This is true not only for doctors and lawyers but also for plumbers and electricians. But it is not true for ICT professionals. In the previous chapter we argued that the common objections given to some form of licensing or certification are not compelling. We commend the current efforts of the ACS in pursuing this issue and recommend that these efforts continue.

We recommend that:

- 1 the ACS continue pursuing the issue of certification in the ICT industry and
- 2 to avoid a conflict of interest and the appearance of self-promotion, the ACS consider the establishment of a new body to oversee this certification.

Certification has an interesting consequence: compliance. The subject of compliance with ethics demands of an integrity system has, deliberately, been avoided in this report. Such a consideration is beyond the scope of this report but is not undeserving of investigation. For example, is it appropriate for the federal government to consider greater penalties for lack of organizational compliance in this area. (ie. If an individual certified professional flags an issue and is overruled by organizational superiors, what are the current corporate penalties and who can impose these?) Presumably, ICT professionals can lose their jobs if they are unethical. Could standard wording be created to provide definition around “unethical” behaviour or asking employees to behave in an unethical manner and used in ICT awards and contracts? Related, but beyond the scope of this report are the following: Does Australian Government legislation need to be updated? and, How does Australian law compare to overseas legislation?

## 4.2.4 Constructing integrity Software

Given the complexity of systems it is not plausible to expect that the integrity system could be managed and compared against other management systems manually: it would need support software. That such software would itself be complex is to be expected and thus would take considerable effort to build. A functional specification of such software would require that the conceptual underpinnings and detailed workings of the integrity system be well understood.

#### 4.2.4.1 For Education

The integrity software would need to have the capacity to deliver some of the educational material that professionals need to be able to understand how to apply the integrity system itself.

#### 4.2.4.2 Integration into Other Processes

A mandatory requirement of the integrity software is that it be able to ensure that all other management procedures (for example project planning, testing, risk management, archiving, etc.) meet with the demands of the integrity system. An outline plan for achieving this is contained in Appendix C - Ethics Management.

### 4.3 Further Research

While there are some things that can be started immediately, there are others which require further research before deciding what is to be done next in the program of increasing ethical thinking, decision making, and behaviour in the Australian ICT industry. The areas identified for further research are: the state of the industry, ethical regulations, technical and ethical tertiary education, and the differing generations that make up the ICT workforce.

#### 4.3.1 State of the Industry

One of the difficulties that appeared early in the survey and the interviews was the lack of a coherent and comprehensible method of allocating professionals to occupational categories. While some work has begun on this much more research is needed to provide one.

In the final question of the survey asking for comments we were struck by the depth of thought that some of the respondents went to. For example, some respondents said that their response to the regulation questions (ought, could, self, and the like) would hinge upon two things, what counts as external to the industry and, who, exactly would do the regulating.

These respondents' questions strengthens the concerns that we make in Appendix C – Defining the ICT Industry and point to the fact that further research needs to be done into the structure of the industry.

Some specific research questions are:

- ▶ What counts as a occupation? Is there a method of describing occupations that minimizes overlap and confusion?
- ▶ What does it mean to be external to the ICT industry and still be knowledgeable of the industry?
- ▶ Who ought to regulate the industry and what makes them qualified to do so?
- ▶ Would the licensing of ICT professionals be to the benefit of the ICT profession and the stakeholders in ICT systems? Would the certification of ICT professionals be to the benefit of the ICT profession and the stakeholders in ICT systems? A comparative study with other jurisdictions that have attempted either of these would seem to be demanded.

### 4.3.2 Ethics Regulations

As hinted at in the previous section the notion of ethical regulations in the industry is somewhat ill-defined, unknown, and poorly used. This leads to at least two areas of research which needs to be taken up before specific content can be included in the management process that supports the integrity system. These two areas are:

- ▶ Less than 70% of respondents indicated that, they were aware of any industry-wide regulations addressing ethical behaviour. Why do as many as 30% of respondents not know of anything that might address ethics? More empirical research is needed to uncover the reasons for this seemingly wide-spread lack of awareness of ethical regulations.
- ▶ Half of the respondents thought that the industry ought to be able to self-regulate but less than 30% thought it could. Less than half of the respondents thought that the industry ought to be externally regulated. More empirical research is needed to get a clearer understanding of the industry's professionals knowledge of the structure and content of regulations.
- ▶ There is debate in the literature, and this was reflected in the survey and interviews, about the efficacy of codes of ethics. We recommend that further research be undertaken to understand better the value of codes. More information is required on what kinds of codes are most effective if the ACS codes are to have maximum effect on the behaviour of ICT professionals.

### 4.3.3 Education

While education is mentioned in the areas for immediate action, many of the results from the survey indicate that the education of ICT professionals is deficient and is in need of further research. There is a serious mismatch between what the tertiary institutions claim to deliver by way of ethics education, what the ACS demands, and what the respondents said they received.

This leads to several areas for further research, namely:

- ▶ Why does ethics education seem to make little or no difference across a number of measures, including recognition of ethical problems and speaking up over unethical acts. We have suggested some remedies but further research is required to pinpoint the crucial factors.
- ▶ What are the actual course contents and delivery mechanisms used by tertiary institutes to fulfill their obligations as part of ACS certification?
- ▶ What is the actual mechanism, and how effective is it, that the ACS uses to ensure that the claims tertiary institutes make for their ethics modules are actually being delivered (and done so effectively)?
- ▶ Would an education campaign to build a case for the importance of and relevance of ethics on individual and organizational outcomes be of merit?



- ▶ Approaching upper management of organizations (for example, Directors, CEO's, and CIO's) to educate them of the relevance of ICT ethical compliance to their bottom line (and in the case of the community to outcomes such as privacy etc) and social responsibility costs of not complying.

#### 4.3.4 Generations

While we expected to see some differences, across the generations of ICT professionals, we did not anticipate that there would be, mostly, general agreement amongst all but one of the generations, Gen Y. Further research is needed to determine the nature, extent of, and reasons for, the differences exhibited by Gen Y. The specific areas requiring research are:

##### 4.3.4.1 For Gen Y

- ▶ Gen Y was more likely to say no when asked if they would speak up over an unethical act? Why should this be so?
- ▶ Gen Y was the least inclined to do what they were asked when requested to do something unethical. Why should this be so when they, on appearances, are in the most vulnerable position?
- ▶ With more tertiary educated people in the ICT workforce we would have expected Gen Y to have more ethics education but this did not turn out to be true. Why should this be so?

##### 4.3.4.2 General

- ▶ None of the respondents indicated that they were employed under an Australian Workplace Agreement. This seems most unlikely and further empirical research is needed to clarify this.
- ▶ What influence would having an AWA<sup>35</sup> have on a respondent's decision to react to seeing and being asked to do, unethical acts?

## 4.4 Implementing the Recommendations

As was mentioned in section 3.5.5 the implementation should be undertaken with a systems development focus. Implementing some of the recommendations will be relatively easy but others will be difficult and take time. Implementing the integrity system as a whole will not be done quickly but some components could be brought on line almost immediately. Here we will consider implementing just a few of the components of the integrity system.

### Education

The report has outlined what appears to be a mismatch between the main concerns of ICT professionals and typical contents of ethics courses. The ACS could require that courses focus on the professional issues mentioned in this report in order to gain ACS accreditation. The ACS could also immediately start to develop ethics training courses for use in organisations that employ ICT professionals. These training courses would not need to be developed from scratch but could be modelled, with appropriate modification to suit the requirements of the relevant

organisations, on existing ethics courses. The other two recommendations related to education will probably be more difficult. With courses already crowded universities will resist being told to have discrete ethics components if they do not have them already, and this is an issue on which there are strong feelings. The situation is similar regarding who should teach ethics. In many cases it could be taught cooperatively between ICT and philosophy departments, but given funding constraints, no department will easily relinquish some of its student load. And again, strong opinions are held on who is best qualified to teach such courses. It would be relatively easy however for the ACS to develop training programs for these teachers.

### **Codes of ethics**

The ACS code of ethics is currently under review and a similar process could be put in place to tailor the code to suit the needs of various sub-sections of the profession, for example, for network managers, HCI developers or software engineers. In the longer term, an on-line version could be developed that automatically focussed on different issues depending on the role of the user. A similar review process could also be undertaken with organisations to incorporate the ACS code into those organisations so that the ACS code was seen as part of the working environment.

### **The integrity system as a whole**

This will be a longer term commitment and will involve cooperation between professional bodies, industry and academia. There are a large number of components to be implemented or developed so they will need to be prioritised, beginning we suggest with education and codes of ethics. Procedures for ethics audits could be implemented fairly easily and ethics impact statements, perhaps initially based around software such as SoDis, could be developed.

The overall task will not be an easy one but if ICT is really to be seen as a profession, it cannot be avoided.

# NOTES

1. The phrase “unprofessional behaviour” was specified by respondents. We do not know what each respondent meant by the term and they did not offer further explanation.
2. Tailored codes for the various occupational groups within the ICT industry are part of the future research agenda. There is a need to suggest sources of resources as current resources within ICT interest groups (industry, professional, etc.) may not be sustainable at this stage.
3. There is much disagreement over the number of ICT workers but even the most optimistic estimate place the ACS membership proportion at less than 10%. Estimated ICT work population 250,000 with ACS membership at approximately 16000. This gives a value of 6.4%.  
If the Australian Bureau of Statistics figures of 355,200 ICT workers are used this proportion drops to less than 5%.
4. IEEE Computer Society website <http://www.computer.org/portal/site/ieeecs/index.jsp> viewed 13 June 2007
5. System Administrators Guild of Australia (SAGE AU) website <http://www.sage.au.org.au/display/SAGEAU/Home> viewed 12 February 2007.
6. Electronic Frontier Foundation website <http://www.eff.org/>, viewed 9 April 2007.
7. Computer Professionals For Social Responsibility website <http://www.cpsr.org/>, viewed 12 May 2007.
8. Professions Australia website <http://www.professions.com.au/> viewed 24 July 2007.
9. The four systems are described in the Josef Wieland (ed.), *Standards and Audits for Ethics Management Systems*, Springer, Berlin, 2003.
10. Josef Wieland, “Values Management System: A New Standard for Values Driven Management”, p. 9-10. Michael Pierce, “AA1000 Series: The Challenge of Accountability Management” in Josef Wieland (ed.), *Standards and Audits for Ethics Management Systems*, Springer, Berlin, 2003, p. 26. Pedro Frances et al, “The Ethical Management System of FORETICA” in Josef Wieland (ed.), *Standards and Audits for Ethics Management Systems*, Springer, Berlin, 2003, p. 44. Simone de Colle et al, “The Q-RES Project: The Quality of Social and Ethical Responsibility of Corporations” in Josef Wieland (ed.), *Standards and Audits for Ethics Management Systems*, Springer, Berlin, 2003, p. 62.
11. Josef Wieland, “Values Management System: A New Standard for Values Driven Management”, p. 4. and Pedro Frances et al, “The Ethical Management System of FORETICA”, p. 41 in in Josef Wieland (ed.), *Standards and Audits for Ethics Management Systems*, Springer, Berlin, 2003.
12. Josef Wieland, “Values Management System: A New Standard for Values Driven Management”, in Josef Wieland (ed.), *Standards and Audits for Ethics Management Systems*, Springer, Berlin, 2003, p. 12.
13. Simone de Colle et al, “The Q-RES Project: The Quality of Social and Ethical Responsibility of Corporations”, in Josef Wieland (ed.), *Standards and Audits for Ethics Management Systems*, Springer, Berlin, 2003, p. 63
14. Covalence SA, Covalence Ethical Quotation System, <http://www.covalence.ch/> [Accessed: 7/6/2007].
15. Covalence SA, Covalence Ethical Quotation System: About, <http://www.covalence.ch/index.php/about-us/> [Accessed: 7/6/2007].
16. Ibid.
17. Covalence SA, Covalence Ethical Quotation System: Clients, <http://www.covalence.ch/index.php/clients/> [Accessed: 7/6/2007].
18. Lisa Roner, “Get with the programme” in *Ethical Corporation, Special Report: The Online Technology Revolution*, June 2007, <http://www.ethicalcorp.com>, p.14.
19. Lisa Roner, “Get with the programme” in *Ethical Corporation, Special Report: The Online Technology Revolution*, June 2007, <http://www.ethicalcorp.com>, p.14.
20. Bernd Carsten Stahl, “Ethics Management Systems, Responsibility, and Information Technology” in Josef Wieland (ed.), *Standards and Audits for Ethics Management Systems*, Springer, Berlin, 2003, p. 216.
21. Ibid., p. 228.
22. Ibid., p. 229.

23. Man-Fong Ho et al., for instance, contrast the relatively undeveloped ethical management practices of the construction company covered in their case study to more rigorous safety management practices. See Man-Fong Ho et al., "Implementing corporate ethics management and its comparison with the safety management system: a case study in Hong Kong", *Construction Management and Economics*, no. 22, July 2004, p. 605.
24. Marc Saner, for instance, considers adapting the theory and practice of total life cycle assessments as applied in the environmental evaluation field to the management of ethical issues. See Marc Saner, *Towards an Ethics Management System for Biotechnology*, Institute on Governance, Ottawa, 2002, p. 3.
25. PUMA, *Principles for managing Ethics in the Public Service*, PUMA Policy Brief No. 4, 1998, p. 4.
26. Marc Saner, *Towards an Ethics Management System for Biotechnology*, Institute on Governance, Ottawa, 2002, p.3.
27. Man-Fong Ho et al., "Implementing corporate ethics management and its comparison with the safety management system: a case study in Hong Kong", *Construction Management and Economics*, no. 22, July 2004, p. 605.
28. PUMA, *Principles for managing Ethics in the Public Service*, 4. Man-Fong Ho et al., "Implementing corporate ethics management and its comparison with the safety management system: a case study in Hong Kong", *Construction Management and Economics*, no. 22, July 2004, p. 605.
29. For the remainder of his section the respondents are simply referred to as they, or the possessive their.
30. The details justifying the assessments made here and the statistical tests used are contained in Appendix A – Empirical Research – Part 1 The Survey.
31. Huntley, 2006, *The World According to Gen Y*, p.89.
32. Huntley, 2006, *The World According to Gen Y*, Chapter 6: A job for life, p.88-102.
33. However it does show a significant problem within the delivery of TAFE ICT ethics competencies. We believe that this also is deserving of further investigation. All of the TAFE ICT programs are required to have included the ethics competencies but clearly they do not.
34. We are aware of Don Gotterbarn's SoDIS and consider it to be a good beginning but it is an incomplete implementation of an integrity system.
35. While it is the stated legislative program of the current Australian Government to abolish Australian Workplace Agreements this is going to take some time and existing AWAs will be not be abolished; that is they will live out their term of agreement. As such it seems important to work out the extent of these in the ICT industry and the impact they have on the survey question.