

Communications of the Association for Information Systems

Volume 8

Article 29

June 2002

Teaching End-User Ethics: Issues and a Solution Based on Universalizability

Mikko T. Siponen

University of Oulu, Mikko.T.Siponen@oulu.fi

Tero Vartiainen

University of Jyväskylä, tvarti@cs.jyu.fi

Follow this and additional works at: <https://aisel.aisnet.org/cais>

Recommended Citation

Siponen, Mikko T. and Vartiainen, Tero (2002) "Teaching End-User Ethics: Issues and a Solution Based on Universalizability," *Communications of the Association for Information Systems*: Vol. 8 , Article 29.

DOI: 10.17705/1CAIS.00829

Available at: <https://aisel.aisnet.org/cais/vol8/iss1/29>

This material is brought to you by the AIS Journals at AIS Electronic Library (AISeL). It has been accepted for inclusion in Communications of the Association for Information Systems by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.



Communications of the **A**ssociation for **I**nformation **S**ystems

TEACHING END-USER ETHICS: ISSUES AND A SOLUTION BASED ON UNIVERSALIZABILITY

Mikko T. Siponen

Department of Information Processing Science

University of Oulu

Mikko.T.Siponen@oulu.fi

Tero Vartiainen

Department of Computer Science and Information Systems

University of Jyväskylä

ABSTRACT

The ethical aspects of computing are increasingly being taught and written about in professional information systems education in universities. However, the ever-increasing role and use of computer technology means that computer ethics education related to computing is also necessary for non-professional/non-major computing/information systems students. Owing to the differences between professional and non-professional education, end-users need a different computer ethics program. First, this paper explores some of the issues (goals, challenges and problems to overcome) in end-user ethics teaching. Second, it proposes a solution based on the concept of universalizability. Third, the paper argues that the universalizability thesis is a proper tool for end-user education. Finally it demonstrates, with the help of three cases, how the solution chosen can be used to solve the issues identified and to educate end-users.

KEYWORDS: computer ethics education, end-user computing

I. INTRODUCTION

The relevance of including ethical issues within the curriculum at a professional level is well established [e.g., Computing Curricula, 1991; Johnson, 1993; McFarland, 1990; Bowyer, 1995; Langford, 1995; Walsham, 1996]. Several papers relating to professional education have been published [e.g., Huff and Martin, 1995; Martin and Huff, 1997; Sedlet, 1999; Yip, 1999; Davison, 2000]. In the modern era of the information society, where an increasing number of people, especially in Western societies, use computers for a variety of purposes, the importance of the ethical dimension for end-users (henceforth referred to as 'end-user ethics') is particularly relevant [Bynum, 1992]. To our knowledge, the issues surrounding end-user education about computer ethics are not yet addressed. The existing research on computer ethics education for end-users is limited to surveys of non-CS/IS (computer science/information systems) students' ethical attitudes about computer usage [e.g., Hanchey and Kingsbury, 1994; Conger *et al.*, 1994; Sumner and Werner, 1997; Gattiker and Kelley, 1999].

The possibilities and requirements for teaching professionals and end-user are different. Therefore, the two groups require separate frameworks for their computer ethics education. For example, students majoring in CS/IS have focus on professional issues, such as developing information systems and software, which is outside the scope of the computing education of the

end-user¹. The education of CS/IS majors is conducted through full-length courses, which should include the study of ethics doctrines and their application. However, the computer ethics education of end-users is restricted by the time and resources available, thereby limiting the theoretical framework within which such an education program can be carried out. Many educational institutions, (including universities, polytechnics, vocational schools, training centers, and high schools) offer computer education and courses. However, we cannot presume that all these institutions allocate the requisite time, will, and skills to provide own full-length course in computer ethics.

Yet, the existence of professional codes of conduct and netiquette does not remove the need to study ethics theories, for the following four reasons.

1. It is not appropriate to teach end-users that a predefined code should be followed dogmatically without considering a single ethical dilemma in the light of ethics theories.
2. Given that various codes exist that are valid, which code should we choose? Different codes offer different definitions of what is "right" and "wrong" [Oz, 1993; consider also "hacker ethics"; Fiery, 1994]. Accepting that they all are "right" would move us into the area of relativism and all its related problems [e.g., Hare [1989] and Niiniluoto [1991]].
3. What should we do if code X (condemns action A) and code Y (praises action A) result in a conflicting view about action A?
4. Even if we wanted to apply codes, they are nevertheless abstract and predefined with the result that individual ethical thinking needs to be exercised in cases where codes do not provide the answer to an ethical dilemma.

The case for end-user education is strengthened by the fact that people find it difficult to extend their ability to reflect ethically in cases where computers are involved. Several explanations for this problem have been put forward:

- conceptual muddle [Moor, 1985],
- moral distance [Conger *et al.*, 1994; Rubin 1994],
- moral crisis [Severson, 1997],
- lack of conventional moral notions [Siponen, 2001], and a
- tendency when under the spell of computers to forget the negative consequences of one's actions [Dunlop and Kling, 1992; Rogerson, 1996]

End-user education is required to prevent such problems arising.

The main objective of this paper is to introduce issues (e.g., problems to resolve; goals in end-user ethics teaching) and a solution to the problem of end-user ethics teaching based on the universalizability thesis. A conceptual-analytical approach described by Järvinen [1997; 2000] is used. Conceptual analysis [Sloman, 1978] is a conceptual-theoretical research tool, which is used not simply to analyze the meanings of words, but to clarify and solve problems that are philosophical in their nature. Furthermore, conceptual analysis is also used to offer a theoretical critique for a previously existing theory. Often, particularly outside philosophy, conceptual analysis may be adopted when some reference discipline is used to solve a problem in a field. In this study, for example, existing theories from the field of moral philosophy (the main reference discipline applied) are taken up to address problems of computer ethics. In this study, issues are drawn from the computer ethics literature and the ethics framework is drawn from the moral-philosophy literature. The framework is then applied critically to address these issues.

The research method adopted, in particular to justify the ethics framework, is "coherentist reasoning", described by Hare [1963, 1999]. Coherentist reasoning means that we find and justify moral principles as well as judgements by testing them in the light of facts [cf., Hare, 1999].

¹However, advanced end-users, who may use fourth-generation languages, do macro programming and so on, also need to be taken into consideration.

The scope of this paper is intended for the enlightenment of non-computer science/IS professionals, and the teaching of computer ethics is restricted to non-computer science/IS majors. However, it is believed that the study is also relevant for CS/IS professionals.

The remainder of this paper is organized as follows. The framework for the study is presented in Section II, starting with the issues of end-user ethics teaching. The process of universalizability is considered. Section III provides a demonstration of how the issues identified earlier can be dealt with, within the theoretical framework of Section II. Section IV contains a discussion of the implications and limitations of the findings. The key issues of the paper are summarized in Section V.

II. ISSUES AND ETHICS FRAMEWORK

Nine issues relevant to end-user teaching were developed from the computer ethics literature (Table 1).

Goals

The aim behind examining this issue is the education of morally responsible users who are able to achieve their own ethical purposes with the help of computers. When we teach the technical skills needed in computer use, we should not forget the ethical dimension surrounding this tool.² The goals for end-user ethics teaching can be defined using the theory of moral psychology called the Four Component Model [Rest, 1994]. According to this model, moral behavior is determined by four psychological components:

1. moral sensitivity,
2. moral judgment,
3. moral motivation, and
4. moral behavior.

These components describe four possible ways in which a person may fail to act morally. Strengthening each of these components is seen as an important goal of ethics teaching.

Moral sensitivity implies awareness of how our actions affect other people. It also involves being aware of alternative actions and how those actions affect other parties. Thus, the goal of end-user ethics teaching should include developing an awareness of how end-users' computer use affects other people. To demonstrate how moral sensitivity may occur, consider the following example. A beginning end-user does not realize that saving large files on a server leads to filling up free space and thus disturbs the functioning of the server and affects other end-users.

As *moral judgment* develops, a person's problem solving strategies become more other-directed and principled in nature. Kohlberg's [1971, 1981] six stages of moral development are based on the theory that people change their moral problem-solving strategies as they grow. People at higher stages can understand the principles they used when at the lower stages but no longer prefer them. Moral judgment and sensitivity were observed to develop with the help of small-group discussions on moral issues [Rest, 1994; McNeel, 1994]. Utilizing small-group discussions on moral issues in computer use could be a means for developing end-users' moral sensitivity and judgment.

Moral motivation refers to prioritizing moral values above non-moral values [cf., Hare, 1963; Ladd, 1982; Rest, 1994]. For example, a user may experience excitement when programming a virus, and perhaps sending the virus to his/her friends as a joke. This user prioritized his/her feelings of excitement above the avoidance of harm³.

Moral character refers to the psychological strength to carry out a line of action. A person may observe the ethically relevant issues, be able to take appropriate moral judgments, and prioritize moral values above non-moral values. However, if this person is weak-willed [cf., Davidson, 1971; Hare, 1963; Horsburg, 1971; Lukes, 1971; Maquire, 1989; Sidgwick, 1893;

² For example, Moor [1985] considers the computer as the nearest artifact we have to a universal tool.

³ In this case, lack of moral sensitivity (first component) may also play a part, provided that the user does not understand the consequences of his/her action.

Table 1. Issues to Consider in Teaching Computer Ethics to Non-CS/IS Students.

Issue	Description	Possible Implementation in Courses	Problems	Examples from Literature
1. Main goals	Morally responsible users who are able to achieve their own ethical purposes with the help of computer technology	Teaching the use of equipment. Promoting ethical use of computer technology for ethical purposes. Discussion about end-user obligations, duties and rights	How to educate responsible users? What are the ethical purposes regarding the use of computer technology, end-user obligations, rights and duties? Problem of weakness of will	Bynum, 2000; Huff and Martin, 1995; Nissenbaum, 1995; Weckert, 1997
2. Analysis of consequences of computer use	Facts and moral responsibilities related to computer usage	The nature of computer technology, the dangers and pitfalls of computer usage and possible future usage. Moral responsibility in the use of "a universal tool"	How to make known the nature of computer technology to non-technology oriented end-users? The problem of respondent superior	Gibbs, 1994; Littlewood, 1995; Musa <i>et al.</i> 1987; Neumann, 2000; Smith, 1995
3. Moral vacuum	Conventional moral notion; the inapplicability to extend our moral thinking in the area of computing; amorality in the area of computer technology	Forming solutions to new situations. Using ethics theories in problem solving. Use and usability of analogies	Problems regarding the use of analogies. Are they relevant and what are their limits?	Ladd, 1989; Moor, 1985; Schulze, 1996; Severson, 1997; Vartiainen and Siponen, 1999; Cappel, 1995
4. Moral distance	The distancing effect of computer technology creates a gap between computer users and the people affected	Making moral distance known to students. Practical exercises with which moral distance may be narrowed	All the consequences of computer usage are impossible to foresee	Ladd, 1989; Neumann, 1988; Rubin, 1994; Johnson, 1997
5. Legislation	The relationship and difference between law and ethics	Introduction to laws related to end-use	Laws may not reflect our moral views. One may not recognize that law is not same as what is morally right or wrong	Kallman and Grillo, 1996; Severson, 1997; Sipior, 1995
6. Solving and avoiding conflicts and dilemmas	Application of ethics theory in a critical way	Dilemma discussions. Moral argumentation. Formulation of proper moral principles for ethical computer usage	Profound critical analysis is time consuming and hard	Collins and Miller, 1992; Kallman and Grillo, 1996; Mason, 1995; Ruggiero, 1997
7. Ethics theories	Describe the different ethics theories	Teaching ethics theories to non-philosophy students	With limited resources the profound teaching of ethics theory cannot be accomplished. What theories should be chosen?	Hare, 1997; Laudon, 1995; MacIntyre, 1987; Raphael, 1994; Singer, 1991; Taylor, 1975; universalizability: Hare, 1963; Hare, 1981; Kant, 1993; Mackie, 1981; Rawls, 1971
8. Ethics of ethics teaching	The ethical problems in ethics teaching. Free will, autonomy, indoctrination and weakness of will	Neutral teachers. Students make their own decisions on how they use computer technology	Full neutrality is difficult to achieve	Lisman, 1998; Macklin, 1980; Warnock, 1975
9. Practice of ethics teaching	Organizational matters in end-user ethics teaching	The most important issues should be covered	Selection of most important issues. How much time and resources are allocated to end-user ethics teaching? Integrated or separated course?	Fisher, 1994; Forester and Morrison, 1993; Johnson, 1994; Martin, 1994; Weltz, 1998; Winrich, 1994

Thomas, 1955] or discouraged he/she may not carry out the preferred line of action. For example, consider an end-user who regards the unauthorized copying of software as morally wrong. Presume that he/she is asked by his/her friends to produce unauthorized copies of software. If he/she acts according to his/her friends' demands, while nevertheless regarding the action as morally wrong, s/he fails the moral character component.

Analysis of the Consequences of Computer Usage

Computers are widely used in organizations, homes and educational institutions with great impact on ordinary people's lives [e.g., Eriksson, 1994]. Owing to the computer's applicability and malleability [Moor, 1985], new applications will continue to emerge (e.g., virtual reality, electronic commerce) and computers will become more and more embedded in society. As a result, we need to recognize ethical issues [Callahan, 1980] in computer use as well as analytical and critical thinking skills [Ruggiero, 1997] to solve the new problems that arise. The aim is to educate end-users about the basic nature of computer technology, such as digitalization [Littlewood, 1995], incorrectness [Smith, 1995; Musa *et al.* 1987] and the risks that accompany the use of computer systems [Neumann, 1988; 2000]. With this knowledge, end-users may learn to understand moral conflicts in computing more profoundly than without it. We also suggest that support professionals are needed to translate the complexities of computer systems for end-users [Rea, 1999].

Moral Vacuum

This issue refers to two kinds of situations:

- a vacuum may exist because moral thinking is not extended to cases related to the use of computers, or
- critical moral thinking is not applied to computer technology.

The second differs from the first in the sense that, in the second case, it is not a question of a lack of a moral view, but rather a lack of a critical moral view, i.e., such a view does not enter critical deliberation. We argue that

- not extending moral thinking to cases concerning computer technology could be a sign of a low level of development of moral sensitivity [Rest, 1994], and
- a tendency to view computer technology as ethically neutral mainly because it involves complex causal networks of responsibility [Ladd, 1989].

The aim of behind examining this issue is to prevent the emergence of a moral vacuum.

Moral Distance

The distancing effect of computers creates a gap between computer users and the people affected [Rubin, 1994] and thereby decreases moral sensitivity [Rest, 1994]⁴. Computer systems cause depersonalization and enhance the possibility of acting anonymously, which in turn may decrease the user's sense of responsibility [Neumann, 1988]. Computers act as intermediaries between people and it would thus be nonsense to ascribe moral responsibility to systems and computers instead of to the individuals who make and use them [Ladd, 1989]. Thus, the aim of end-user ethics teaching should be to narrow moral distance and to elicit personal responsibility [Callahan, 1980]. Developing moral sensitivity [Rest, 1994] is also important because the use of this technology is expanding and new computer technology-related phenomena (e.g., virtual reality) are creating new ethical questions, such as the ethics of cybersex [Adeney, 1999; Johnson, 2001]. With moral imagination [cf., Callahan 1980] these bright new alternatives could be explored in cyberspace.

Without the recognition of personal responsibility and morally right conduct, societies may become more self-centered and morally questionable acts may increase. The key question is to find ways to narrow moral distance.

Legislation

The key issues are:

⁴ Moral sensitivity, in the context of end-use, is the ability to recognize morally relevant issues related to computer use, in end-user computing.

1. the possible role of legislation in moral thinking, and
2. the difference between legislation and what is morally right/wrong.

Solving and Avoiding Moral Conflicts and Dilemmas.

The aim is to resolve, and foresee moral conflicts and dilemmas [cf., Bradley, 1987; Gowans, 1987] in computer usage. To achieve this aim, we need continuing discussions on values in computer technology and its application in different spheres of human life. Ethics theories give us good insights into moral conflicts [e.g., Hare, 1981; Ruggiero, 1997; Weckert, 1997]. Without deliberating a conflict in the light of ethics theories, we would be limited to our intuitions and conventional or cultural notions. Discussions in which groups of students try to solve moral dilemmas, was observed to develop moral sensitivity and judgment [Rest, 1994; McNeel, 1994].

Ethics Theories

Ethics theory offers an understanding about competing views in ethics and the difficulties encountered in decision-making in human life. Several ethics theories [see e.g., Hare, 1997; Mason, 1995; Raphael, 1994; Singer, 1991] exist. The theory of ethics should be taught as a self-evident part of ethics courses and include the solving of moral conflicts and discussions on values. Without a theory of ethics, an in-depth understanding of the alternatives and of justifications and defensible solutions cannot be achieved. The key problem is, what ethics theory/theories should be chosen?

Ethics of Ethics Teaching

Among the major moral conflicts involved in ethics teaching are those concerning the autonomy and free will of one's students. Indoctrination imposes a body of doctrines held by the teacher or some authority on the student. The student, in turn, receives beliefs uncritically based on the unquestioning authority of the teacher [Warnock, 1975; Macklin, 1980; Lisman, 1998]. It is easy for indoctrination to occur – even outside of “formal” education goals, as in the so-called hidden curriculum [Jackson, 1968; Kohlberg, 1983]. Students taught by a charismatic teacher may not be inclined to doubt what s/he says. Indoctrination should be avoided since it impedes autonomy. Since free will and autonomy are prerequisites for ethical decision-making, we cannot hold someone responsible if s/he is not capable of independent decision-making [Hare, 1952, 1964, 1975, 1976, 1999].

For Kant, all education inevitably compromises the individual's free will and autonomy, because education always comes from outside the individual's autonomy. Kant called this phenomenon the pedagogical paradox [Kant, 1993]⁵. Russell adopted a similar standpoint. For Russell, all teaching includes propaganda [Russell, 1932]. Hare [1964] suggested that education differs from indoctrination because an educator desires that his/her students (as the objects of education) will start thinking for themselves. The aim of an indoctrinator is to restrict this thinking process. Smart [1973 p. 43] argues that Hare's criterion means that an educator should take Kant's rule of human dignity⁶ seriously: the indoctrinator on the other hand regards students as a means, not as ends in themselves. We incline to Hare's view. The aim is as far as possible to avoid indoctrination. By teaching a theory of ethics, methods of critical analysis [Ruggiero, 1997], and developing awareness of how computer technology functions and affects, we can equip our students with tools to help them make individual choices. In this way the students' autonomy is not violated [see also Hare 1976]. Moral sensitivity and judgment can be developed by means of dilemma-discussion, while allowing the development of moral motivation and character to rest more with the individual.

Practice of Ethics Teaching

Key questions concerning practice of ethics teaching are:

1. Should end-user ethics be taught as an integrated or separate course?

⁵ Note: The reference is to a reprint of Kant's work published in 1993 that is accessible to readers of this paper. The original work appeared in German in 1780's.

⁶ According to Kant's rule of human dignity, we should treat other people always as an end, never only as a means.

2. Who should teach computer ethics? and
3. How should teaching be implemented within the restraints of the resources available (e.g., time, teacher's competence, user competence)?

Questions 1 and 2 are discussed here.

Ethics can be taught as an integrated topic [Winrich, 1994; Weltz, 1998] or as a separate course [Fisher and Abunawass, 1994] in computer education. There has been some discussion about who should teach computer ethics (e.g., computer scientists/IS scholars or philosophers) [Johnson, 1994; Martin, 1994] to computer science students. Similar questions arise in the case of end-user ethics teaching. Computer scientists/IS scholars or professionals know more technically about computing than philosophers but the ethical questions about end-users are more related to how this equipment is used and the interaction of end-users in networks. However, without a profound knowledge of computer use and the technology behind it, faculty are at a serious disadvantage in attempting to teach end-user ethics.

Theoretical Framework for a Solution

As listed in Sidebar 1, many theories of ethics exist. From among of these theories and decision-making formulas, we chose the universalizability thesis, which has a crucial role in ethics of Rawls [1971], Gewirth [1978; 1982; 1996], Kant [Kant, 1993], the Judeo-Christian teaching [e.g., the Golden Rule in the case of Christian ethics: "One ought to treat others as one would wish them to treat oneself"; Hare, 1963], Confucius [e.g., "What you do not desire, do not effect on others"; Hansen, 1991], Hare [universal prescriptivism; 1981] and Mackie's [1981] approach. We claim that the universalizability thesis offers an adequate and justified approach for end-user ethics teaching. In Appendix II we briefly summarize some of the key objections leveled in the literature against the universalizability thesis and we try to provide counter arguments.

SIDEBAR 1 REPRESENTATIVE ETHICS THEORIES

- Cungfutse [Hansen, 1991],
- The theory of information ethics [Floridi, 1998; 1999],
- Gewirth's theory [1978; 1982; 1996]
- Habermas' [1990] discourse ethics,
- Universal prescriptivism [Hare, 1952; 1963; 1981, 1999],
- Hegel's theory [e.g., Sabine, 1963],
- Kantian ethics [Kant, 1993],
- Utilitarianism [e.g., Bentham, 1876; Mill, 1895],
- Intuitionism [Moore, 1903; Ross, 1930],
- Mackie's [1981] approach,
- The theory of justice [Rawls, 1958; 1963; 1967; 1972; Pogge, 1989], and
- Emotivism [Stevenson, 1944],
- Religious theories such as Christian ethics [e.g., Hare, 1963; Outga, 1972; Thomas, 1955].
- Virtue ethics [e.g., Crisp & Slote, 1997; MacIntyre, 1987].
- Decision-making formulas based on different ethics theories including [Collins and Miller, 1992; Kallman and Grillo 1996; Ruggiero, 1994; Langford, 1995].

The Universalizability thesis

According to the universalizability thesis, *if one judges that one's action in a particular situation is right, one must then acknowledge that a similar act by anybody else in a similar situation would also be right* [e.g., Hare, 1981]. Therefore, the thesis of universalizability paves the way for equality. In other words, we cannot allow ourselves or any other group any special privileges.

It can be argued that our judgments are subjective and biased; in other words they always reflect our background. That is, an independent position can be difficult to achieve, and thereby result in the 'impartial' universalizability of the moral judgment approaches provided by philosophers such as Kant and Confucius. The "partial" interpretation of the thesis of universalizability includes subjective constraints, i.e., individuals may come up with a solution that only they would prefer, as in theory there are as many viewpoints as there are individuals. For example, the Kantian type of universalizability - utilize only the kind of maxim which can become a universal law - is that practiced by a 15-year-old schoolboy when he sets up a maxim [M1] "15-year-old boys who hold grade 5 Latin can break into information systems". It is difficult to claim that such indicators as 15-year-old, boy and grade 5 in Latin count for much here. To avoid these problems, universalizability in the case of moral judgments, as in Hare [1963; 1981], is argued to be independent of age, gender and similar criteria, and would interpret maxim M1 as "is it right that everybody can break into information systems?"

We may end up with the same result utilizing Rawls' [1971] veil of ignorance, a form of the universalization thesis. Rawls' veil refers to the imagined veil that enables us to pretend we are ignorant of information about ourselves such as our personal preferences, age, gender, social status, profession, and financial situation. In other words, under this imagined veil of ignorance we do not know who we are exactly. In the case of Rawls' version of the universalizability thesis, we would not know e.g., our age and grade in Latin⁷ (cf., M1 above). So one would not gain any extra privileges by inserting such qualifiers as "15-year-old boys" and "grade 5 in Latin" (because under the veil of ignorance a person does not know his/her age, etc.). A more detailed discussion on Rawls' theory can be found in Appendix II. Mackie [1981], discussed in more detail in Appendix II, also tries to avoid the trap of one's own preferences.

In some situations the impartial type of universalizability does not solve the issue. For example a single person may consider an action to be right when everyone else considers it to be inherently wrong. However, if this individual then applies the principle of impartial universalizability s/he may reconsider the moral rightness of their action.

III. APPLYING THE FRAMEWORK

3 CASES

To show how the issues identified can be tackled using the universalization thesis, the chosen solution, we now apply the thesis to three cases representative of end-user ethical issues:

- use of the Internet,
- use of databases, and
- the allocation of scarce computer resources.

We first describe these cases and then interpret them by using each of the nine issues presented in Section II and summarized in Table 1.

Case 1: The Internet

The first case concerns the use of the Internet. It comes within the scope of Johnson's [2001] global many-to-many definition, illustrating the ability of individuals to act effectively and powerfully on the Internet with little effort. However, such "little effort" may affect the lives of other Internet users considerably. Case 1 is an abbreviated description of a real-life case considered by Johnson [2001 p. 85], originally researched by Marc Pang Quek:

"Two attorneys sent an advertisement to various Internet newsgroups. This spam mail outraged many newsgroup subscribers. The attorneys received many complaints about their behavior but they also made plenty of business contacts."

⁷ Under the veil of ignorance, we would not even know whether we studied Latin or not.

Case 2: Databases

Improper use of information obtained from databases may threaten individuals' privacy [cf., Johnson and Nissenbaum, 1995]. Case 2 concerns an end-user browsing a database and is taken from an ethics workshop in which the participants had the task of analyzing designed scenarios. Case 2 is one such scenario [Parker *et al.* 1990, p. 109]:

'An administrative person working in his assigned area of accounts receivable found, as a result of browsing various menu screens, that he was able to access the personnel data base. He was not authorized to work on personnel applications, but the data base was not marked confidential. He found various records of other employees including earnings, salary increases, date of birth, date employed, and other personal information. He confronted his immediate manager and stated that he was not receiving salary increases as fast as other people, claiming he "knew what was going on!" The manager replied that a salary increase was pending and the employee was being treated fairly.'

In the analysis of this case we focus purely on the moral issue connected with browsing the database, leaving aside any possible moral issue concerning the fair treatment of personnel as outside the scope of this paper.⁸

Case 3: Resource allocation

In organizations, systems administrators and support professionals [Rea, 1999] handle requests for both hardware (servers, workstations, printers) and software (office packages, browsers). Case 3 presents a moral issue relating to the fair allocation of an organization's resources. One of the authors of this paper experienced this conflict on many occasions during his work as a laboratory engineer in a university department. Case 3 is as follows:

"An end-user thinks he needs more computing power for his purposes. He discusses his problem with a technician. The technician receives many appeals for more efficient machinery but the organization's budget is limited. The question thus arises about who really needs new machinery and how the restricted resources should be allocated."

Goals

When teaching technical computing skills [e.g., word processing, email] the relevant ethical questions could be handled either at the same time as or immediately after the technical modules. We suggest that the universalizability thesis provides a good foundation on which to achieve the goals of end-user ethics teaching, i.e., morally responsible users. When used in-depth, the universalizability thesis allows us to look at the situation impartially from a variety of viewpoints [Section 2], and it shows us if our moral principle is intrinsically a conflicting one.

Analysis of the consequences of computer use

The universalizability thesis presumes that the environment can be identified and understood *a priori*. However, such understanding may not be the case in computing since, as the problems of moral vacuum and moral distance (discussed next) indicate, the consequences of computer usage may not be understood easily by end-users. A heavy burden is, therefore, placed on educators to provide the facts about the consequences of computer use. However, the universalizability thesis is useful, particularly when the facts are known, since it forces us to deliberate whether we would find the action we were about to perform acceptable if we were on the receiving end. It therefore may reduce the moral vacuum and moral distance.

One possible solution that has not yet been applied is the use of modeling, such as that in software/information systems development. Several structural and object-oriented methods which, through the use of modeling, aim at managing and understanding the complexity involved [e.g., livari, 1994; livari *et al.*, 1998; Hirschheim *et al.*, 1995; Lyytinen, 1987]. However, modeling

⁸ In any case we don't possess enough information on the matter.

is likely to be beyond the scope of teaching end users due to the amount of time and skills this method requires. The modeling approach may, however, be applicable in professional education, since those students may already be familiar with modeling if it is covered in courses on software engineering/IS development.

Moral vacuum

New phenomena are continuously being created in the domain of computer technology (e.g., Internet and virtual reality). The ethical questions that arise become more complex and intertwined with technical issues. Students should be taught to consider issues and cases, like those presented in the Section III, in which moral thinking is not generally considered by end-users. The students could observe as well as participate in computer use (e.g., Internet) and try to identify situations where there appear to be no moral rules or where end-users do not seem to know what kind of behavior is acceptable. We propose the application of the universalizability thesis in defining proper guidelines for use in novel situations.

In dealing with complex and new ethical issues in computing, analogies with ethical and social issues are often used for purposes of clarification [Schulze, 1996]. The usage of analogies brings with it at least one problem: phenomena may be incommensurable to the extent that they are only partially comparable. For example, it can be argued that making illegal copies of software is morally wrong because stealing physical things is likewise morally wrong. However, this argument ignores the differences in the nature of physical things and software, i.e., tangible vs. intangible, and their implications for drawing conclusions about morally correct behaviour [cf., Weckert, 1997; Weckert & Adeney, 1997]. Students should be encouraged to perform critical analyses of justifications based on analogies.

In all three cases, end-users may not understand the ethical dimension of their actions (moral sensitivity) or if they do, they either do not care (moral motivation or character) or they do not consider the issues at stake as moral ones (amorality). In case 1 the attorneys do not seem to perceive (or do not care) that their actions create anger within newsgroup subscribers when they send advertisements to a site where they are not wanted or are not appropriate. The attorneys may of course understand this but may not be sufficiently motivated to refrain from their line of action because of financial gain. However, they would be offended by inappropriate offers by computer firms in a discussion group among lawyers!

In the same way, presuming in case 2 that the user is motivated by personal inquisitiveness alone, the end-user's motivation to put moral values (respect for the right to privacy of other persons) above other values (curiosity to know) is insufficiently strong. Or it just did not occur to him that he would not like it if his personal data were to be perused by an unauthorized individual (the Golden Rule).

In case 3 the larger question concerning fairness in the allocation of resources is not within the realm of end-users as such but of support personnel. If an end-user does not really need greater computing power but nonetheless asks for it, s/he would not be universalizing their action.

Moral distance

In networks (e.g., Internet, intranets, local area networks) end-users affect each other in various ways. For example, the content of home pages, e-mail and newsgroup articles have at least an indirect effect on all other users. It would be quite impossible in such an environment to take into account the myriad preferences of people from all over the world. It is possible to try to imagine oneself in the shoes of the other end-users, applying the Golden rule "One ought to treat others as one would wish them to treat oneself" [Hare, 1963]. This may not be enough in the sense that if we wanted to interact ethically with other people we should make a serious effort to know other peoples' preferences.

End-users should be able to understand how other parties are affected by their actions. To do so requires technical knowledge about what kind of effects computer systems and computer use have. In addition, we would suggest that moral distance can be narrowed with the help of moral argumentation [e.g., dilemma discussion]. During moral argumentation "discussants confront and attempt to resolve differences in their respective positions on the moral focus of the verbal interaction." [Berkowitz, 1985]. Moral argumentation is assumed to stimulate the growth of moral stages. For example, many points of view are presented in a dilemma discussion, some of which may be in conflict with our own. One is at liberty to defend one's viewpoint and criticize the viewpoints of others. One student may know something that another student does not know (e.g.,

how certain act affects people in networks) and s/he may explain it to him during the dilemma discussion. In this way sensitivity to the affected parties develops. We propose that these discussions include the application of the universalizability thesis. Cases similar to the ones discussed here could be used as a basis for dilemma discussions. Students should be encouraged to find out how other users are affected by individual or group actions, and what their preferences might be.

Legislation, ethics and moral thinking

It should be stressed in connection with this issue that the existence of legislation does not rule out the role of ethics or moral thinking. We should consider legislation and any action proposed by law in the light of the universalizability thesis. This being the case, we may end up with the following results.

- The legislation itself may be right, wrong or amoral from the moral point of view.
- An action which some consider to be morally right may be banned by legislation and vice-versa.
- Even if one chooses to follow the law, there are many cases where legislation does not exist and therefore does not provide a solution.

To judge whether actions should be allowed or banned by legislation and whether such actions are morally right or wrong, we need to be aware of theories of ethics.

Solving and Avoiding Moral Conflicts

Hare [1981] proposes that we should try to emulate critical thinking of the ideal ("objective") observer, Hare's Archangel, in formulating the simple and generic prima facie principles, which we use intuitively in our day-to-day lives. When those principles conflict we may be forced to override one principle or even reconsider them. Similarly, we should choose prima facie principles critically to guide our actions in day-to-day computer usage. Hare's [1981] Archangel might be comparable to Mackie's [1981] third stage universalizability (Appendix II), but for humans it is, in its fullest sense, impossible.

In end-user ethics teaching students should be given exercises (such as cases 1, 2 and 3) in which they analyze possible courses of action, and formulate principles by which moral conflicts in similar situations can be avoided. Such principles and actions should be tested by the universalizability thesis and subject to critical discussion.

In case 1 the manager could apply the Golden Rule "One ought to treat others as one would wish them to treat oneself" [Hare, 1963]. Let us presume that the attorneys themselves do not find advertisements placed in newsgroups annoying. This being the case, they might conclude that they are entitled to send advertisements to newsgroups as they do not mind reading them in newsgroups. The Golden Rule, interpreted thus, is problematic as it fails take into account other peoples' preferences in the Internet environment. However, by modifying the attorneys' interpretation of the Golden Rule-type of universalization in the direction suggested by Hare, Mackie and Rawls we may be able to tackle such weaknesses. For example, the attorneys might try to imagine the preferences of newsgroup subscribers. If they concluded that subscribers to newsgroups do not want to read advertisements (or that they do not want advertisements for computer consulting in their law reviews) they would not then be able to universalize their act.

Assume, as in case 2, that an end-user is browsing other peoples' data out of curiosity. In this case, we apply the Golden Rule and the Kantian-type universalizability thesis. Would that individual find it acceptable if someone else were to examine his personal information? If he finds this unacceptable, then, in the name of equality, he should not commit this action. If however he had no objections then we can test his action using Kant's version of the universalizable thesis. If the act of browsing other peoples' personal data just for curiosity were to become a universal law, there would be no privacy protection. We nonetheless feel that some protection of privacy is needed to ensure that personal information is not revealed to every one.

For the resolution of case 3 we demonstrate how Rawls' concept of the veil of ignorance, as a form of the universalizability thesis, could be applied to solve the case [see also Collins et al., 1994]. Behind the veil of ignorance participants (support personnel and end-users in this case) negotiate to reach a societal agreement without any knowledge concerning their own interests, and without knowing how any alternative will affect their own positions. With the help of

the imagined negotiation behind the veil we try to determine what kind of agreement the parties could formulate in our example. The agreement would include certain obligations. The parties would consent to and be bound to these obligations after the veil is raised and they start to act in the real-world. We restrict our analysis to the domain of computer use in an organization.

In our case, the task of support personnel is to help end-users and to maintain computer systems. The least advantaged parties would be those end-users whose equipment is inadequate for the tasks they perform and/or end-users with poor computer skills. These disadvantages could have harmful consequences because end-users are unable to complete the tasks required of them or systems become corrupted. A contract, which support personnel and end-users behind the veil could accept, might include principles concerning fair play within the large group of end-users and between the end-users and support personnel. It might be agreed that end-users have at least some kind of duty to acquire the computer skills necessary to be able to manage – at least to some extent - without support or help-desk personnel.

One goal in everyone's interest would be to avoid harm and risk. Everyone behind the veil might agree that users should learn to avoid harm and risk. Given that under the veil of ignorance, when we would not know who we are, we would like to live in a society where people would avoid unnecessary harm and risks. This outcome would imply agreeing that every one makes an effort to find out how their actions affect other people and take proactive measures to prevent harm or risk. Behind the veil every one would be aware that it is the "nature" of computer technology to create new phenomena and equipment and that in consequence new risks will emerge (e.g., new viruses)⁹. The obligation to update one's computing skills might be accepted by all. Behind the veil every one might agree that the work of support personnel is both demanding and critical to the success of the organization. It would be their obligation to ensure that the organization's computer systems are secure and reliable. In summary, the parties might accept the obligations intended for end-users and technical support personnel listed in Tables 2 and 3.

Table 2: Obligations of End-users

Towards Other End-users	Towards Support Personnel
Try to understand the effects of their computer use on others.	"Reasonable requests of computing power" [Collins and Miller, 1994].
Try to minimize possible harm and risk to other users.	
Update their own computing skills.	

Table 3: Obligations of Support Personnel

Towards End-users	Towards Other Support Personnel
Equip end-users with reasonable computer technology for the tasks they have to perform.	Update their own knowledge of computer technology.
Manage the computer systems so that using computers is safe and reliable.	Keep track of computer equipment and allocate new resources within reasonable budget constraints.

The end-user's obligation to make 'reasonable requests of computing power' [Collins and Miller, 1994] and the proposed obligation for support personnel that they 'Equip end-users with reasonable computer technology for the tasks they have to perform' apply to case 3. The end-user and the technician should discuss the end-user's needs and if a reasonable request is within the constraints of the budget the end-user should be given more efficient machinery. If the budget

⁹ This postulation stems from the fact that under the veil we would know certain basic facts that are relevant to our moral judgments (Appendix II).

limits do not provide the end-user with proper machinery, the solution to the problem should be attained in some other way, for example by reallocating machinery inside the organization or increasing the budget.

Ethics of ethics teaching

The requirements of free will and autonomy can be fulfilled by the universalizability thesis. Given that the educator presents the facts and explains how the thesis is applied, end-user autonomy and free will is not violated: the moral thinking is left to end-users. Universalizability is a thesis that offers us a logical tool [cf., Hare, 1963] for creating and testing our "own" moral principles in different situations.

Moreover, the use of autonomy and free will can be justified with the help of the universalizability thesis: would you like to be subject to indoctrination by another? For most of us the answer would be in the negative.

Ethics teaching in practice

Lectures and practical exercises are needed in end-user ethics teaching. Lectures could include analysis of computer usage, theories about moral vacuum and distance, laws, and the universalizability thesis. During exercises, students should put theory into practice, such as reflecting upon behavior on the Internet and writing essays on applying the universalizability thesis. The grading of students' results, e.g., for depth of analysis and coverage, would be good for motivation.

End-user ethics teaching will likely come up against the availability of teacher resources and teaching timeframes. We argue that the universalizability thesis is adequate for end-user ethics teaching because it is simple and easy to understand (although its application requires practical exercises) and relevant as an ethics doctrine (Section II).

IV. LIMITATIONS OF THE PAPER AND IMPLICATIONS FOR RESEARCH AND PRACTICE

LIMITATIONS OF THE PAPER

With respect to the limits of the paper, some empiricists [cf., Quine, 1951] may question the relevance of conceptual analysis and highlight the need of empirical evidence. Such a claim is valid to some extent. A qualitative study may reveal additional issues relevant to end-user education. Moreover, the moral development of computer students has been studied on the basis of Kohlberg's [1981] theory of Cognitive Moral Development [Bickel et al., 1992]. We take the view that the study of the "ease of use" and "perceived usefulness" [cf., Davis, 1989; Mathieson, 1991; Venkatesh & Davis, 2000] of theories of ethics is also an important future research question for end-users. However, even though there is room for empirical studies, we believe that the conceptual analysis research approach and the coherentist reasoning research method used here are relevant and at this stage even vital.

End-user ethics education lacks a systematic framework. Hence, a framework such as that proposed in this study is a prerequisite for any future research. Furthermore, the validity of an ethics framework is best explored in the light of conceptual analysis, because the question of the validity of theories of ethics is conceptual analytical in its nature [cf., Hare, 1985; Niiniluoto, 1999]. This is hardly surprising considering that the de facto research approach in moral philosophy and theological ethics is conceptual analysis.

IMPLICATIONS OF THE PAPER

The paper points out several avenues for future research. Contributions to dealing with the problems of moral vacuum and moral distance are particularly welcomed. It is also suggested that modeling approaches, such as those used to develop information systems or software, may be used to tackle the problems of moral vacuum and moral distance, and to understand the effects of our computing actions on other parties. Although we believe that this educational idea is more suited to professionals, since they may already be familiar with information systems and software developmental methods, further research is needed in this area.

V. CONCLUDING REMARKS

Although the need of computer ethics education at the professional level is now recognized, end-user/non-professional ethics education is as yet an untouched area. Even though the ethical issues synthesized in this paper are relevant to both professional and non-professional (non-CS/IS major) users, for non-professional end-users lighter teaching tools are required. For students majoring in CS/IS, it is both possible and recommended that a course (or courses) on computer ethics be assigned where several ethics theories can be taught. For pragmatic reasons, this solution is not available for end-user ethics teaching. Nowadays, computers are used in different educational institutions. However, it is unlikely that every one of these institutions will have the necessary resources (including will, time, proficient teachers) to arrange a full course on computer ethics. And yet, the ethical dimension needs to be addressed at all levels of computer education. Hence, the need of a separate framework for end-users is seen as essential.

From this point of departure, this paper examined a set of issues relevant in teaching computer ethics to end-users and looked into the underlying problems and challenges involved. It proposed, by reference to the three cases introduced in Section III, that the universalizability thesis is sufficient for end-user education. We have shown how ethics issues can be tackled with the help of the universalizability thesis. Since empirical studies have not yet been carried out on the computer ethics education of end-users, our future research orientation will be to implement the strategy based on the universalizability thesis and explore teaching strategies that facilitate the learning process.

Editor's Note. An earlier version of this article appeared in the proceedings of 34th Hawaii International Conference on System Sciences (HICSS-34) [Siponen and Vartiainen, 2001].

This article, which was fully peer reviewed, was received on August 12, 2001. It was with the authors 21 weeks for 3 revisions. The article was published on June 27, 2002

REFERENCES

- Adeney, D. (1999) "Evaluating the Pleasures of Cybersex" *Australian Journal of Professional and Applied Ethics*, (1)1, July, pp. 69-79.
- Bentham, J. (1876), *An Introduction to the Principles of Morals and Legislation*, Clarendon Press, Oxford, UK.
- Berkowitz, M.W. (1985) "Four Perspectives on Moral Argumentation" in Harding C.G. (ed.) *Moral Dilemmas*, Chicago: Precedent Publishing, Inc. pp. 1-24.
- Bickel, R.W., M.M. Larrondo-Petrie, D.F. Bush, (1992) "EDICT for Computer Ethics Education" *Journal of Systems Software*, (17)1, pp. 81-89.
- Bowyer, K.K. (1995), *Ethics and Computing - Living Responsibility in a Computerized Word*, Los Alamitos, CA: IEEE Computer Society Press.
- Bradley, F.H. (1987) "Collision of Duties" in Gowans C.W. (ed.) *Moral Dilemmas*, New York: Oxford University Press. pp. 62-82.
- Bynum, T.W. (1992) "Computer Ethics in the Computer Science Curriculum", in Bynum, T.W., W. Maner, J.L. Fodor (eds.) *Teaching Computer Ethics*, Research Center on Computing and Society, New Haven, CT: Southern Connecticut State University, pp. 12-25, 1992.
- Bynum, T.W. (2000) "The Foundation of Computer Ethics" *Computers & Society*, (30)2, pp. 6-13, June.
- Callahan, D. (1980) "Goals in the Teaching of Ethics" in Callahan D., S. Bok (eds.) *Ethics Teaching in Higher Education*, New York: Plenum Press. pp. 61-80.
- Cappel, J.J. (1995) "A Study of Individuals' Ethical Beliefs and Perceptions of Electronic Mail Privacy" *Journal of Business Ethics* (14) pp. 819-827.
- Collins, W.R., K.W. Miller (1992) "Paramedic Ethics for Computer Professionals", *Journal of Systems Software*, (17)1, pp. 23-38.

- Collins, W.R., K.W. Miller, B.J. Spielman, P. Wherry (1994) "How Good Is Good Enough?" *Communications of ACM*, (37)1, January, pp. 81-91.
- Conger, S., K.D. Loch, B.L. Helft (1994) "Information Technology and Ethics: An Exploratory Factor Analysis" *Ethics in the Computer Age Conference Proceedings*, Gatlinburg: Tennessee, November 11 – 13, pp. 22-27.
- Crisp, R. and M. Slote, (1997) *Virtue Ethics*, Oxford, UK: Oxford University Press.
- Davidson, D. (1971) "How is Weakness of Will Possible" in Mortimore G. (ed.) *Weakness of Will*, London: Macmillan, pp. 93-113.
- Davis, F.D., (1989) "Perceived Usefulness, Perceived Ease of Use and User Acceptance of Information Technology" *MIS Quarterly* (13)3, pp. 319-339.
- Davison, R.M. (2000) "Professional Ethics in Information Systems: A Personal Perspective" *Communications of AIS*. (3)8, April.
- Dunlop, C., R. Kling (1992) "Social Relationships in Electronic Commerce – Introduction", in Dunlop C. and R. Kling (eds.) *Computerization and Controversy - Value Conflicts and Social change*, New York: Academic Press,
- Eriksson, I.V. (1994) "Computers as Tools" *Ethics in Computer Age Conference Proceedings*, Gatlinburg, Tennessee, November 11 – 13, pp. 86-95.
- Fiery, D. (1994) *Secrets of a Super Hacker*. Port Townsend, Washington, USA: Loompanics Unlimited,
- Fisher, T.G., A.M. Abunawass (1994) "Computer Ethics: A Capstone Course" *Ethics in The Computer Age Conference Proceedings*, Gatlinburg, Tennessee, November 11-13, pp. 74-79.
- Floridi, L. (1998), "Does Information Have a Moral Worth in Itself?" *Proceedings of the ACM Computer Ethics: Philosophical Enquiry*, London, UK, 14-15 December.
- Floridi, L. (1999) "Information Ethics: On the Philosophical Foundation of Computer Ethics" *Ethics and Information Technology*, (1)1, pp. 37-56.
- Forester, T. and P. Morrison (1993) *Computer Ethics: Cautionary Tales and Ethical Dilemmas in Computing*, Cambridge, MA: MIT Press,.
- Gattiker, V.E. and H. Kelley (1999) "Morality and Computing: Attitudes and Differences in Moral Judgments" *Information Systems Research*, (10)3, pp. 223-254.
- Gewirth, A. (1978) *Reason and Morality*, Chicago: The University of Chicago Press.
- Gewirth, A. (1982) *Human Rights: Essays on Justification and Applications*. Chicago: The University of Chicago Press.
- Gewirth, A. (1996) *The Community of Rights*. Chicago: The University of Chicago Press.
- Gibbs, W. (1994) "Software's Chronic Crisis" *Scientific American*, No 9, Vol. 271, pp. 72-81.
- Gowans, C.W. (Ed.) (1987) *Moral Dilemmas*. New York: Oxford University Press
- Habermas, J. (1990) *Moral Consciousness and Communicative Action*, Cambridge, UK: Polity.
- Hanchey, C.M., J. Kingsbury (1994) "A Survey of Students' Ethical Attitudes using Computer Related Scenarios" *Ethics in The Computer Age Conference Proceedings*, Gatlinburg, Tennessee, November 11-13, pp. 2-6.
- Hansen, C. (1991) "Classical Chinese Ethics" in Singer P. (Ed.) *Companion to Ethics*, Oxford, UK: Basil Blackwell, pp. 69-81.
- Hare, R.M. (1952) *The Language of Morals*. Oxford, UK: Oxford University Press.
- Hare, R.M. (1963) *Freedom and Reason*, Oxford, UK: Oxford University Press.
- Hare, R.M. (1964) "Adolescents into Adults" in Hollins T.C.B (ed.) *Aims in Education* Manchester, UK: Manchester University Press. Reprinted in R.M. Hare (ed.) (1992): *Essays on Religion and Education*, Oxford, UK: Oxford University Press.
- Hare, R.M. (1975) "Autonomy as an Educational Idea" in Brown S.C. (ed.) *Philosophers Discuss Education*, London: Macmillan. Reprinted in R.M. Hare (ed.) (1992) *Essays on Religion and Education*, Oxford, UK: Oxford University Press.
- Hare, R.M. (1976) "Value Education in a Pluralist Society: A Philosophical Glance at the Humanities Curriculum Project" *Proceedings of the Education Society of Great Britain*. Reprinted in R.M. Hare (ed.) (1992) *Essays on Religion and Education*, Oxford, UK: Oxford University Press.
- Hare, R.M. (1981) *Moral Thinking, Its Levels, Method and Point*. Oxford, UK: Oxford University Press.

- Hare, R.M. (1985) "Ontology in Ethics" in Hondrich T. (ed.) *Morality and Objectivity: Essays in Memory of John Mackie*. London: Routledge, pp. 87-103.
- Hare, R.M. (1987) "Moral Conflicts" in Gowans C.W. (ed.) (1987) *Moral Dilemmas*, New York: Oxford University Press, pp. 205-238.
- Hare, R.M. (1989) "A Reductio ad Absurdum of Descriptivism" in Hare R.M. (ed.) *Essays in Ethical Theory*, Oxford University Press, Oxford. UK.
- Hare, R.M. (1997) *Sorting out Ethics*, Oxford, UK: Oxford University Press.
- Hare, R.M. (1999) "Foundationalism and Coherentism", in Hare R.M. (ed.) *Objective Prescriptions and Other Essays*, Oxford, UK: Oxford University Press,.
- Hill, T. (1986) "Weakness of Will and Character" in Adler J., R.N. Lee (eds.) *Philosophical Topics. Papers on Ethics*, (14)2, pp. 93-115.
- Hirschheim, R., H.K. Klein, and K. Lyytinen (1995) *Information Systems Development and Data Modelling: Conceptual and Philosophical Foundations*. Cambridge, UK: Cambridge University Press.
- Horsburgh, H.J.N. (1971) "The Criteria of Assent a Moral Rule" in Mortimore G. (ed.) *Weakness of Will*, London: Macmillan, pp. 118-131.
- Huff, C., D.C. Martin (1995) "Computing Consequences: A Framework for Teaching Ethical Computing" *Communications of the ACM*, (38)12, December, pp. 75-84.
- Iivari, J., (1994), "Object-Oriented Information Systems Analysis: A Comparison of Six Object Oriented Analysis Methods" in Verrijn-Stuart A.A. and T.W. Olle (eds.) *Methods and Associated Tools for the Information Systems Life Cycle*, IFIP Transactions A-55, Amsterdam:North-Holland.
- Iivari, J., R. Hirschheim, H.K. Klein, (1998) "A Paradigmatic Analysis of Contrasting Information Systems Development Approaches and Methodologies" *Information Systems Research*, (9)2, pp. 164-193.
- Järvinen, P. (1997) "The New Classification of Research Approaches" in Zemanek H. (ed.) *The IFIP Pink Summary - 36 years of IFIP*, Laxenburg, Austria: International Federation of Information Processing Societies.
- Järvinen, P. (2000) "Research Questions Guiding Selection of an Appropriate Research Method" *Proceedings of the 8th European Conference on Information Systems (ECIS 2000)*, Vienna, Austria July 3-5.
- Jackson, P.W. (1968) *Life in Classrooms*. New York: Holt, Rinehart and Winston.
- Johnson, D. (1993) *Computer Ethics*, Upper Saddle River, N.J.: Prentice Hall.
- Johnson, D. (1994) "Who Should Teach Computer Ethics and Computers & Society" *Computers and Society*, (24)2 June, pp. 6-13.
- Johnson, D., and Nissenbaum H. (eds.) (1995) *Computers, Ethics & Social Values*, Upper Saddle River, N.J.: Prentice Hall.
- Johnson, D. (1997) "Ethics online" *Communications of ACM*, Vol. (40)1, January, pp. 60-65.
- Kallman E.A, and J.P. Grillo (1996) *Ethical Decision Making and Information Technology, An Introduction with Cases*, New York: McGraw-Hill.
- Kant I. (1993) *The Moral Law: Groundwork of the Metaphysic of Morals*, London: Routledge.
- Kohlberg, L. (1971) "Stages of Moral Development as a Basis of Moral Education" in Beck C.M., B.S. Crittenden, and E.V. Sullivan (ed.) *Moral Education: Interdisciplinary Approaches*, Toronto, Canada: Toronto University Press, pp. 23-92.
- Kohlberg, L., (1981) *The Philosophy of Moral Development: Moral Stages and the Idea of Justice. Essays on Moral Development, Volume I*. San Francisco: Harper & Row.
- Kohlberg L. (1983), "The Moral Atmosphere of the School" in Giroux H. and Purpel D. (eds.) *The Hidden Curriculum and Moral Education*. Berkeley, CA: MrCutrhan Publishing Corporation, pp. 61-81
- Kukathas, C. & Pettit, P. (1990) *Rawls - A Theory of Justice and its Critics*. Stanford, CA: Stanford University Press.
- Ladd, J. (1989) "Computers and Moral Responsibility: A Framework for an Ethical Analysis" *The Information Web, Ethical and Social Implications of Computer Networking*. Boulder, CO: Westview Press.

- Ladd, J., (1982), "Collective and Individual Moral Responsibility in Engineering: Some Questions" *IEEE Technology and Society*, (1)2, pp. 288-289.
- Langford, D. (1995) *Practical Computer Ethics*, New York: McGraw-Hill.
- Laudon, K. (1995) "Ethical Concepts and Information Technology" *Communication of ACM*, (38)12, December, pp. 33-39.
- Littlewood, B., Strigini L. (1995) "The Risks of Software" in Johnson D.G., H. Nissenbaum (eds.) *Computers, Ethics and Social Values*, Upper Saddle River, NJ: Prentice Hall, pp. 432-437.
- Lisman, C.D. (1998) "Ethics Education in Schools" *Encyclopedia of Applied Ethics*, Volume 2, San Diego, CA: Academic Press, pp. 139-146.
- Lukes, S. (1971) "Moral Weakness" in Mortimore G. (ed.) *Weakness of Will*, London: Macmillan, pp. 147-159.
- Lyytinen, K., (1987) "Two Views on Information Modeling" *Information & Management*, (12)1, pp. 9-19.
- MacIntyre, A. (1987) *After Virtue: a Study in Moral Theory*, London: Duckworth.
- Mackie, J.L. (1981) *Ethics, Inventing Right and Wrong*, London: Penguin.
- Macklin, R. (1980) "Problems in Teaching of Ethics: Pluralism and Indoctrination" in Callahan D., and S. Bok (eds.) *Ethics Teaching in Higher Education*, New York: Plenum Press, pp. 81-102.
- Maquire, D. (1989) "Ethics: How To Do It?" in Hamel R.P. and K.R. Himes (eds.) *Introduction to Christian Ethics – A Reader*, Mahwa, NJ: Paulist Press, pp. 533-550.
- Martin, C.D. (1994) "Comments on the Feature Article" *Computers and Society*, (24)2, June, pp. 7-9.
- Martin, C.D. & Huff, C.W. (1997) "A Conceptual and Pedagogical Framework for Teaching Ethics and Social Impact in Computer Science", *Proceedings of 27th Annual Frontiers in Education Conference: Teaching and Learning in an Era of Change*. Vol. 1.
- Mason, R.O. (1995) "Applying Ethics to Information Technology Issues" *Communications of ACM*, (38)1, pp. 55-57.
- Mason, R.O., Mason F.M., Culnan M.J. (1995) *Ethics of Information Management*, Thousand Oaks, CA: Sage Publications.
- Mathieson, K. (1991) "Predicting User Intentions: Comparing the Technology Acceptance Model with the Theory of Planned Behavior" *Information Systems Research* (2)3, pp. 173-191.
- McFarland, M.C., (1990) "Urgency of Ethical Standards Intensifies in Computer Community" *IEEE Computer*, (23)3, March, pp. 77-81.
- McNeel, S.P. (1994) "College Teaching and Student Moral Development" in Rest J.R., D. Narvaez (eds.) *Moral Development in the Professions: Psychology and Applied Ethics*, Mahwa, NJ: Lawrence Erlbaum Associates, pp. 27-50.
- Mill, J.S. (1895) *Utilitarianism*, London: Routledge.
- Moor, J.H. (1985) "What is computer ethics?" *Metaphilosophy*, (16)4, pp. 266-275.
- Moore, G.E. (1903) *Principia Ethica*, Cambridge, UK.
- Musa, J.D., Iannino A., Okumoto K. (1987) *Software Reliability, Measurement, Prediction, Application*. New York: McGraw-Hill.
- Neumann, P.G. (1988) "Are Risks in Computer Systems Different from Those in Other Technologies?" *Software Engineering Notes*, (13)2, pp. 2-4.
- Neumann P. (2000) "Risks to the Public" *Software Engineering Notes*, (25) 3, May, pp. 15-23, 2000. Also in WWW: <http://www.csl.sri.com/neumann/> (17 August 2000).
- Niiniluoto, I. (1991) "What's Wrong with Relativism", *Science Studies*, (4)2, pp. 17-24.
- Niiniluoto, I. (1999) *Critical Scientific Realism*. Oxford, UK: Oxford University Press.
- Nissenbaum H. (1995) "Should I Copy My Neighbor's Software?" in Johnson D.G., H. Nissenbaum (eds.) *Computers, Ethics and Social Values*. Upper Saddle River, NJ: Prentice Hall, pp. 200-212.
- Outga, G. (1972) *Agape: An Ethical Analysis*, New Haven, CT: Yale University Press.
- Oz, E. (1993) "Ethical Standards for Computer Professionals: A Comparative Analysis of Four Major Codes" *Journal of Business Ethics*, (12)9 709-726.
- Parker D.B., Swope S., Baker B.N. (1990) *Ethical Conflicts in Information Science, Technology, and Business*, Wellesley MA: QED Information Sciences.

- Pence, G. (1993) "Virtue Theory" in Singer P. (ed.) *A Companion to Ethics*, Oxford, UK: Basil Blackwell, pp. 249-258.
- Pogge, T.W. (1989) *Realizing Rawls*. Ithaca NY: Cornell University Press.
- Quine, W.V.O. (1951) "Two Dogmas of Empiricism" *The Philosophical Review* (60), pp. 20-43.
- Raphael, D.D. (1994) *Moral Philosophy*, Oxford University Press, Oxford, UK.
- Rawls, J. (1958) "Justice as Fairness" *Philosophical Review*, (67)2, pp. 164-194.
- Rawls, J. (1963) "Constitutional Liberty and the Concept of Justice" Reprinted in Freeman S. (ed.) *John Rawls: Collected Papers*, Cambridge, MA: Harvard University Press, pp. 73-95.
- Rawls, J. (1967) "Distributive Justice" in Laslett P. and G. Runciman (eds.) *Philosophy, Politics and Society*. Oxford, UK: Basil Blackwell, pp. 58-82.
- Rawls J. (1971) *A Theory of Justice*, London: Oxford University Press.
- Rea D. (1999) "Bridging Worlds: The IT Support Professional as Interpreter Between Cultures" *Proceedings of the 27th Annual ACM SIGUCCS User Services Conference*, November 7 - 10.
- Rest, J.R. (1994) "Background: Theory and Research" in Rest J.R., D. Narvaez (ed.) *Moral Development in the Professions: Psychology and Applied Ethics*, Mahwah, NJ: Lawrence Erlbaum Associates pp. 1-26.
- Rogerson, S. (1996) "The Ethics of Computing: the First and Second Generation" *The Business Ethics Network News*, Issue 6.
- Ross, D. (1930) *The Right and the Good*. Oxford, UK: Oxford University Press.
- Rubin, R. (1994) "Moral Distancing and the Use of Information Technologies: The Seven Temptations" *Ethics in the Computer Age Conference Proceedings*, Gatlinburg, Tennessee, November 11 - 13, pp. 151-155.
- Ruggiero V.R. (1997) *Thinking Critically About Ethical Issues*, Mountain View, CA: Mayfield Publishing Company,.
- Russell, B. (1932) *Education and Social Order*. London: Allen & Unwin. Sabine, G.H. (1963) *A History of Political Theory*. (3rd edition). London, UK.
- Sandel, M., (1982) *Liberalism and the Limits of Justice*. Cambridge, UK: Cambridge University Press.
- Schulze K.G., F.S. Grodzinsky (1996) "Teaching Ethical Issues in Computer Science: What Worked and What Didn't" *Proceedings of the twenty-seventh SIGCSE technical symposium on Computer Science Education*, p. 98-101, February 15 - 17, Philadelphia, USA.
- Seanor, D. and N. Fotion, (1988), *Hare and Critics - Essays on Moral Thinking*, Oxford, UK: Oxford University Press.
- Sedlet, S. (1999) "Computers, Ethics, Law and Society: What do we Teach Undergraduates?" *Proceedings of the 1999 International Symposium on Technology and Society - Women and Technology: Historical, Societal, and Professional Perspectives*. 29-31 July
- Severson, R.J. (1997) *The Principles of Information Ethics*. Armonk, NY: M. E. Sharpe.
- Sidgwick, H. (1893) "Unreasonable Action" *Mind*, (2), pp. 174-187.
- Singer P. (ed.) (1991) *A Companion to Ethics*, Blackwell, Oxford.
- Sipior J.C. and T.W. Burke (1995) "The Ethical and Legal Quandary of Email Privacy", *Communications of the ACM*, (38)12, December pp. 48-54.
- Siponen, M.T. (2001) "The Relevance of Software Rights: An Anthology of the Divergence of Sociopolitical Doctrines" *AI & Society*, (15)1&2, pp. 128-148.
- Siponen, M.T., T. Vartiainen (2001) "End-User Ethics Teaching: Issues and a Solution Based on Universalization" in Sprague R.H. (ed.) *Proceedings of the 34th Hawaii International Conference on System Sciences*, Los Alamitos, CA: Computer Society Press.
- Sloman, S. (1978) *The Computer Revolution in Philosophy: Philosophy, Science and Models of Mind*. Hassocks, UK: Harvester Press.
- Smart, P. (1973) "The Concept of Indoctrination" in Langford G. and D.J. O'Connor (eds.) *New Essays in the Philosophy of Education*, London: Routledge & Kegan Paul, pp. 33-46.
- Smith B.C. (1995) "Limits of Correctness in Computers" in Johnson D.G., H. Nissenbaum (eds.) *Computers, Ethics and Social Values*. Upper Saddle River, NJ: Prentice Hall.
- Spinello, R.A. (1996) *Case Studies in Information and Computer Ethics*, Upper Saddle River, NJ: Prentice Hall,

- Stevenson, C. L. (1944) *Ethics and Language*, New Haven: Yale University Press.
- Summers, C., E. Markusen (1997) "Why Good People Do Bad Things" in Ermann M.D., M.B. Williams and M.S. Shauf (ed.) (1997) *Computers, Ethics and Society*. (2nd edition), Oxford, UK: Oxford University Press, pp. 285-302.
- Sumner M., K. Werner (1997) "On-line Ethics: a Comparison of the Attitudes of Freshmen, MIS Majors, and Practitioners" *Proceedings of the 1997 Conference on Computer Personnel Research*, April 3-5, San Francisco, USA.
- Taylor, P.W. (1975) *Principles of Ethics - An Introduction*, Encino, CA Dickenson.
- Tomas, G.F. (1955) *Christian Ethics and Moral Philosophy*. New York: Scribner's & Sons.
- Tucker A. (ed.) (1991) *Computing Curricula 1991*, Report of the ACM/IEEE-CS Joint Curriculum Task Force, New York: ACM Press.
- Vallance E. (1983) "Hiding the Hidden Curriculum: An Interpretation of the Language of Justification in Nineteenth-Century Educational Reform" in Giroux H. & D. Purpel (eds.) *The Hidden Curriculum and Moral Education*, Berkeley, CA. McCutchan Publishing Corporation, pp. 9-27
- Vartiainen T. and Siponen M.T. (1999) "Conceptual Framework for Teaching Computer Ethics at the University Level to Non-Computer Science Students" *AICEC99 Conference Proceedings*, 14-16 July.
- Venkatesh, V. and F.D. Davis (2000) "A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies" *Management Science*, (46)2, pp. 186-204.
- Warnock M. (1975) "The Neutral Teacher" in M. Taylor (ed.) *Progress & Problems in Moral Education*, Windsor: NFER Publishing Company, pp. 103-112.
- Walsham, G. (1996) "Ethical Theory, Codes of Ethics and IS Practice" *Information System Journal*, (6)1, pp. 69-81.
- Weckert J., D. Adeney (1997) *Computer and Information Ethics*, Westport, CT: Greenwood Press.
- Weltz E.Y. (1998) "A Staged Progression for Integrating Ethics and Social Impact Across the Computer Science Curriculum" *Computers and Society*, (28)1, March, pp. 30-34,
- Winrich L.B. (1994) "Integrating Ethical Topics in A Traditional Computer Science Course" *Ethics in The Computer Age Conference Proceedings*, Gatlinburg, Tennessee, November 11-13, pp. 120-126.
- Yip, S.P. (1999) "Educating IT students Ethics by using a Cognitive Dissonance Theory Perspective" *Proceedings of AICEC99 Conference, Melbourne, Australia*.

APPENDIX I

ALTERNATIVE THEORIES OF ETHICS

This appendix discusses the reasons why we believe universalizability is preferred to several other theories of ethics.

UTILITARIANISM

We do not favor utilitarianism (an act that produces the greatest happiness for all people is a morally right action) for the following reasons:

1. Accounting for all peoples' preferences is a difficult task;
2. It is not a convincing argument that all preferences, no matter how brutal they may be, are equal;
3. In accounting for our preferences we are merely paying lip service to the prevailing

EMOTIVISM

Emotivism [cf., Stevenson, 1944], intuitionism [cf., Moore, 1903] and cultural relativism may also pay lip service to the conventional moral notation (i.e., the prevailing cultural habits). They do not provide a rational account in the case of practical dilemmas. Consider a case where

according to one person's intuitions/emotions/cultural values an action is morally right, while according to another persons' intuitions/emotions/cultural preferences the same action is wrong. What can be concluded from this case? It does not help us to determine whether this action should be performed. More particularly, it does not give us a rational account of why this action is right or wrong, given that we do not feel arguments such as "because this is my intuition/emotions/cultural view" are adequate reasons for an action (or avoiding an action). See e.g., [Hare, 1997] for a detailed discussion on the weaknesses of these theories.

VIRTUE ETHICS

The weakness of virtue ethics lies in justifying what virtues we should adopt. According to virtue ethics, when faced with an ethical dilemma we need first to ask what kind of people we are (or would like to be) in order to select from possible courses of action [Pence, 1993; Macintyre, 1987; Crisp and Slote, 1997]. Virtue theory itself does not equip us with good virtues, but the course of action to be chosen is left to the moral agent him/herself. Virtue theory takes personal character into account, which is an important aspect of ethics, but one which also demands a huge personal investment from students and teachers alike. For end user ethics, we prefer the universalizability thesis above virtue theory because universalizability provides more direct answers and is easier to adapt to teaching than virtue theory. Given that the resources (time, teachers) with respect to end-user ethics teaching is limited, virtue ethics runs foul of practical problems: justifying a particular set of virtues is philosophically problematic and virtue ethics does not tell us what we should do in the case of conflicting virtues [Crisp and Slote, 1997]. Tackling such problems may be possible in a computer ethics course taught by a teacher who is an expert in moral philosophy, but end-user ethics teaching (where time and teacher skills in moral philosophy are limited) requires a simpler approach. However, we support the ultimate goal of virtue ethics, which is to develop good characteristics in people.

PRIMA FACIE APPROACH

We do not favour the prima-facie approach put forward by Ross [1930] as the foundation of end-user ethics teaching, as the list of prima-facie principles becomes increasingly long [cf., Hare, 1981], and in the case of moral conflicts the prima-facie approach does not provide us with much help. We believe that the universalizability thesis is more usable in end-user ethics teaching than do prima-facie principles because the universalizability thesis [when applied profoundly] tells us more directly what to do than prima-facie principles. Indeed, with the help of the universalizability thesis one can formulate prima-facie principles, which can be overridden in conflicting cases.

INFORMATION ETHICS

The reason we do not favour the theory of information ethics by Floridi [1998, 1999], as it bears on end-user ethics teaching, albeit we admit that we find the theory an attractive moral qualifier, is that the universalizability thesis is more practical for end-user teaching. The problems of moral distance and moral vacuum (Section II) are cases in point. The key issue in the theory of information ethics is entropy (disorder) in the infosphere¹⁰. In this theory, entropy is a bad thing and one should always avoid causing entropy. A morally blameworthy act increases entropy, whilst a morally good act is the one that extends information quantity, improves information quality and enriches information variety in the infosphere. The wrongness of an action, or of rival actions, should be measured in terms of entropy (e.g. the action producing the least entropy is the least worse one). For example, lying would increase the entropy in the infosphere.

It is postulated that ordinary end-users do not "intuitively" connect entropy with wrongdoing: would you connect it to a wrongdoing? The process of pondering whether entropy will increase by an action on our part may not awaken our feeling of moral sensitivity: would one be distressed if one heard that one had increased the amount of entropy in the infosphere? On the other hand, if the action is considered in the light of the universalizability thesis, i.e., "What if

¹⁰ Infosphere refers to the information environment [Floridi, 1999]. It can be perhaps understood as the world or universe viewed in terms of information.

this were to happen to me?" or "What if other people treated me that way?" the issue touches the individual directly. For the aforementioned reasons we prefer the universalizability thesis in the case of end-user education.

APPENDIX II

RAWLS' AND MACKIE'S VERSIONS OF UNIVERSALIZABILITY

Rawls sees that the aim of the veil of ignorance is to hide those facts that are morally irrelevant (such as age, religion, level of physical or intellectual ability, economic and social status, religion, gender) and thus can bias our judgment. As a result, under the veil of ignorance, we do not know whether we are poor, rich, white, black, disabled, male, female, young, old, etc. However, behind the veil everyone would know the certain facts on politics, psychology, economics, the existence of social inequalities, and religious beliefs, for example. In other words, under the veil of ignorance we ponder what principles of justice we would like to govern a society we live in, where we could be anyone in any position.

Rawls argues in his theory of justice that, in deciding what moral principles they would accept, people under the veil of ignorance would arrange economic and social inequalities in favor of the least advantaged persons. All participants behind the veil also have the right to veto the agreement, which guarantees that the least advantaged parties are taken into account in the contract. Behind the veil, the possibility of becoming one of the least advantaged is open to every participant. All would guarantee the positions of the least advantaged by using their right of veto to protect those parties. To give an example, when formulating a societal contract behind the veil, the fair treatment of disabled people, for example, would be guaranteed because these would be among the least advantaged parties.

Mackie [1981] extended the universalizability idea¹¹ to take into account

- other peoples' desires, tastes, preferences, ideals and values, and
- external situations leading to the formulation of action-guiding principles.

These principles should be acceptable both from one's own and other peoples' points of view. Mackie calls this third stage universalizability. However, this definition raises problems similar to those encountered in utilitarianism (Appendix I). It is sometimes difficult to know the preferences of other people in the Internet environment. Moreover, it is counter-intuitive to take into account the preferences of all: are all preferences, irrespective of how malicious they may be, equal?

Nevertheless, we believe that the virtue of the universalizability thesis lies in the rationality and equality it enforces. If we do not know the situation of the participants (e.g., status, sex, age) when we are choosing the principles on which we are to structure society, as in the case of the "veil of ignorance" invoked by Rawls [1971], the universalizability standpoint can be argued to ensure equality because the situation is held to be impartial. It is considered impartial because behind the veil no one knows his/her real status or interests in real life.

This kind of deliberation, which relies on universalizability, albeit rational and equal in the sense that it removes egotistic behavior, may not indicate that the chosen state of affairs is the right one or the best possible. It merely reflects the preferences of certain people. However, it could be argued rather persuasively, that the universalizability thesis is the best approach if the situation chosen is one that people see as right and just (this idea is very similar to Rawls' justification of the 'justice as fairness' doctrine). In this case, what else would we need?

Sandel [1982, p. 21] argued that Rawls' "veil of ignorance" constitutes a "radically disembodied subject" who is incapable of making rational choices. First, in Sandel's view, we cannot be independent agents without particular values and social commitments. Second, Sandel maintains that we must ask "Who am I?" while in Rawls' view the pertinent question is "What do I prefer?" Sandel's argument that the end of moral reasoning is not judgment but self-discovery is not very convincing. Self-discovery doesn't replace moral judgment about how one should live.

For example, a Finnish person X, who had deeply-held atheistic beliefs, was once forced to examine the question of the unauthorized copying of software. In Sandel's account ("Who am

¹¹ We see that this is an extension to Kantian, Confucian and the Golden Rules types of universality thesis.

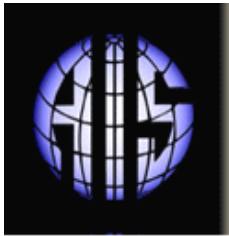
I?") the conclusion of this 'moral' survey was nothing more than "I am a Finnish atheist" (example modified from Kukathas and Pettit 1990, p. 109). Equally, we can all reply to this question by stating "This is what we are" without engaging in the activity of moral reasoning.

ABOUT THE AUTHORS

Mikko Siponen is assistant professor in the Department of Information Processing Science at the University of Oulu, Finland. His research focus is on IS security, IS development and ethical aspects of IS. His publications appear in such journals as *ACM Computers & Society*, *Information Management & Computer Security*, *AI & Society*, *Information Resource Management Journal*, and others. One of his papers received the outstanding paper award in the 2000 volume of *Information Management & Computer Security*. He also authored or co-authored over 45 conference papers and book chapters. He was visiting research scholar at the Department of Computer Information Systems, J. Mack Robinson College of Business, Georgia State University, USA in 2000-2001.

Tero Vartiainen is a PhD student in the Department of Computer Science and Information Systems at the University of Jyväskylä, Finland. His specializations are in computer ethics education and moral conflicts in IS development projects.

Copyright © 2002 by the Association for Information Systems. Permission to make digital or hard copies of all or part of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and full citation on the first page. Copyright for components of this work owned by others than the Association for Information Systems must be honored. Abstracting with credit is permitted. To copy otherwise, to republish, to post on servers, or to redistribute to lists requires prior specific permission and/or fee. Request permission to publish from: AIS Administrative Office, P.O. Box 2712 Atlanta, GA, 30301-2712 Attn: Reprints or via e-mail from ais@gsu.edu.



Communications of the Association for Information Systems

ISSN: 1529-3181

EDITOR-IN-CHIEF

Paul Gray
Claremont Graduate University

AIS SENIOR EDITORIAL BOARD

Cynthia Beath Vice President Publications University of Texas at Austin	Paul Gray Editor, CAIS Claremont Graduate University	Sirkka Jarvenpaa Editor, JAIS University of Texas at Austin
Edward A. Stohr Editor-at-Large Stevens Inst. of Technology	Blake Ives Editor, Electronic Publications University of Houston	Reagan Ramsower Editor, ISWorld Net Baylor University

CAIS ADVISORY BOARD

Gordon Davis University of Minnesota	Ken Kraemer Univ. of California at Irvine	Richard Mason Southern Methodist University
Jay Nunamaker University of Arizona	Henk Sol Delft University	Ralph Sprague University of Hawaii

CAIS EDITORIAL BOARD

Steve Alter U. of San Francisco	Tung Bui University of Hawaii	H. Michael Chung California State Univ.	Donna Dufner U. of Nebraska -Omaha
Omar El Sawy University of Southern California	Ali Farhoomand The University of Hong Kong, China	Jane Fedorowicz Bentley College	Brent Gallupe Queens University, Canada
Robert L. Glass Computing Trends	Sy Goodman Georgia Institute of Technology	Joze Gricar University of Maribor Slovenia	Ruth Guthrie California State Univ.
Chris Holland Manchester Business School, UK	Juhani Iivari University of Oulu Finland	Jaak Jurison Fordham University	Jerry Luftman Stevens Institute of Technology
Munir Mandviwalla Temple University	M. Lynne Markus Bentley College	Don McCubbrey University of Denver	Michael Myers University of Auckland, New Zealand
Seev Neumann Tel Aviv University, Israel	Hung Kook Park Sangmyung University, Korea	Dan Power University of Northern Iowa	Maung Sein Agder University College, Norway
Peter Seddon University of Melbourne Australia	Doug Vogel City University of Hong Kong, China	Hugh Watson University of Georgia	Rolf Wigand Syracuse University

ADMINISTRATIVE PERSONNEL

Eph McLean AIS, Executive Director Georgia State University	Samantha Spears Subscriptions Manager Georgia State University	Reagan Ramsower Publisher, CAIS Baylor University
---	--	---