

‘Cyber-Ethics’ Considered Harmful

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1. Introduction

More than 30 years ago Edsger Dijkstra wrote a seminal paper “Go to statement considered harmful” [Dijkstra 1968] in which he made the radical proposal that the “the use of the **go to** statement has such disastrous effects, and I became convinced that the **go to** statement should be abolished from all "higher level" programming languages”. The claim was made because he recognized a series of problems generated for computing by the use of this statement.

There are similarly significant difficulties with the handling of “Cyber-Ethics” or Internet ethics (Ie) understood as the study of ethical issues related to the Internet. Consistent with the historical flavor of this conference the issues with Ie will be examined in their historical context.

2. Computer Ethics Background

The beginning of computing in the US was welcomed with great fanfare and optimism by the media. In the 1950’s it was claimed that computers would soon model thinking and they were first used to calculate election returns. A UNIVAC used by CBS news predicted the outcome of the presidential election between Dwight D. Eisenhower and Adlai Stevenson. Its predicted results from analyzing early returns, was quite different from what the opinion polls had shown. UNIVAC predicted victory for Eisenhower, while opinion polls predicted a landslide win for Stevenson.

Computers were wonderful devices which would take the drudgery out of our lives. As computing power began to permeate society, the tone and focus of the rhetoric changed to highlight the risks and problems with computing. Fifteen years ago “Computer Ethics” also focused on recounting the exploits of evil people who did unethical and illegal things with the aid of computers.

Terry Bynum [1991] calls this approach to computer ethics, "pop ethics"ⁱⁱ The goal of "pop ethics" is to "sensitize people to the fact that computer technology has social and ethical consequences." The pop ethics course generally consisted of litanies of the evils caused with the aid of computers. "Newspapers, magazines and TV have increasingly engaged in computer ethics of this sort. Every week, for example, there are new stories about computer viruses, or software ownership law suits, or computer-aided bank robbery, or harmful computer malfunctions." [Bynum] "Pop-ethics" courses are justified on the grounds that it is necessary to sensitize people to the fact that computer technology can "threaten human values as well as advance them." If we presume that students are literate and read newspapers or magazines then they

already have read the tales of the threatening computer. Even if they are not literate and only watch television, they will still have this knowledge. It looks, at first blush, as if "pop-ethics" courses were merely an accouterment to the university curriculum dressing up its concerns with ethics; were it only that simple. Such courses actually posed a significant threat to the development of a professional approach to computing.

2 a. Threats

Such courses were in fact a threat to most of the objectives for computer ethics. There is a common approach taken by these courses was primarily negative. These collections were labeled "Cautionary Tales" or "Risks". This negative approach has consequences for the prospective computer professional as well as for the student who did not intend to be a professional. Leon Tabak, in his excellent paper "Giving Engineers a Positive View of the Social Responsibility," argues that such a negative approach fails for students who are interested in pursuing careers in computing. When they are interested in ethics, they are interested in the way they can positively contribute to the world and how they can apply their skills productively. The pictures painted of technology by such courses are essentially pessimistic. This harmed the development of computer ethics and its utility. The student community was at best entertained by the repeated stories about bums, crooks, and evil people who used computers. They saw little relevance of these stories to themselves- who they considered as basically honest hard working people whose goal it was to develop good software.

Because of the emphasis on catastrophes people thought that the kinds of problems pointed to were unlikely to occur in their lives and so computer ethics issues are viewed as rare and irrelevant to the average student. If computer ethics is concerned with catastrophes- the failure of a program which controls the safety switches of a nuclear reactor- then students thought that they needn't worry about computing and values because they will never be involved in such specialized programming. How is this catastrophe relevant to the student who works part-time in the library programming the computer? One also might wonder what it had to do with ethics. If a problem is caused by a mistake --an unintentional act-- then what does it have to do with ethical decisions? The evil litany approach conveys the sense of irrelevancy.

Other items discussed in such courses do involve intentions-specifically criminal intentions. They include: how easy it is to use a computer to commit fraud or to break into a hospital database. If computer ethics (the pop version) is about all of those immoral people who use computers to perpetrate evil, how does it relate to the individual MORAL conscientious computer student who always tries to do the right thing? These pop-ethics examples are interesting but irrelevant to these students. Major social issues are also discussed in these courses. For example, "Is it permissible to sell computers to nations which support terrorism?" The discussion of this is interesting and includes elements of geo-politics and questions about how and whether to propagate scientific discovery. For most students, however, such large questions are not within their present or future sphere of ethical decision making and are best discussed in social science or political science courses. The discussion of such complex large issues strikes many of the students as merely an "academic" exercise.

Even if the students understood some element relevant to their careers, it is a barren approach which generates a distorted impression of ethics and ethical reasoning. Many of these courses were not guided by a single coherent concept of computer ethics. Every piece of negative news involving a computer became a candidate for discussion in a pop ethics course. The breadth of the material included did not help the student get a clear concept of computer ethics. The degree to which this approach misled is evident in a book by Morrison and Forrester in pop-ethics. They included subjects from the impact of video display terminals on health to the use of computers by organized crime and then they claimed that computer ethics has no guiding principles or ethics from which we can reason. [Morrison 1990]

This claim flies in the face of significant research evidence that, in professional ethics, there was actually a convergence of opinion about computer ethical standards. [Chilson]; the pop ethics approach selectively focused on cases where there was little agreement

From this view that there never was any agreement in ethics, there was a danger that students will conclude that it is a waste of time to think about ethical issues at all. Ethics as presented in these courses is not relevant to the student taking the course. This approach created the impression that because there is no agreement, the discussion of computer ethics is useless. The emphasis on the negative side did not give the computer student any experience avoiding real computer ethics problems.

The approach also encouraged an attitude of surrender. If ethics is a matter of opinion and all opposing arguments have equal weight, then the student will not expect support for what they consider to be a moral act. When they are placed in a situation which requires them to take a moral stand, then they are more likely not to "make a fuss" and not stand up for the moral choice.

The reactive emphasis did not encourage proactive behavior. Students were encouraged merely to judge the morality of an act that has occurred rather than to determine or guide action to prevent or discourage immoral behaviors.

If it encouraged any action at all, it encouraged actions against what is perceived as the value-threatening technology, rather than action to turn the technology in a value-supporting direction. For example, we were encouraged to make laws against nationwide databases rather than make laws which encourage the moral use of nationwide databases. Instead of praise for automatic teller machines, they are characterized as "...a good example of how a new technological device creates new opportunities for fraudulent activity." [Morrison. p. 8] The issue is somehow tied to the machine.

Compute Ethics Harms. (CEH)

CEH1 Computer ethics did not seem relevant to the moral and conscientious computer person

.CEH2 No Theory to help Understanding

CEH3 No principles to aid decision making

CEH4 Practitioners, Teachers, and Students are misled- the approach frequently ties the concept to machine rather than to the practice and behavior of individuals.

CEH4a It seemed acceptable to still allow value free language about responsibility- ‘Developers were not responsible for Bugs.’

CEH4b It only deals with proscribed activities -- don't embezzle, don't commit fraud, etc.

CEH4c focus is on finger pointing after the fact not preventative action.

CEH5 The role of computer ethics was seen by some [James Moor] as attempting To fill policy vacuums created by all of these illegal activities,

2b Threats abating and the emergence of ‘responsibility’

“Pop ethics” did not address the ethical responsibility of software developers. But computer ethics slowly recognized a significant gap in that approach. Rather than its being a useless, but self-gratifying, exercise in finger pointing at the behavior of malcontents, computer ethics is relevant when it addresses the complex needs of honest hard working computer professionals who have to handle tough professional questions about the development and impact of their systems. It was realized that when honest professionals do not pay attention to ethical issues that their decisions often lead to unintentional negative social consequences. In response to this revised and corrected concept, many computer ethics books now include major sections on professional issues. Professional societies have revised their Codes of Ethics in the past decade to help educate their membership about their positive professional and ethical responsibilities. Software development books contain chapters addressing professional ethical issues. The professional is concerned with how to make the software better internally and whether the software makes things better.

Computer ethics changed from the “pop ethics” approach to an engineering ethics approach, i.e., ethical issues directly related to the practice of engineering should be discussed in every engineering course. The ABET standard states, "An understanding of the ethical, social, and economic considerations in engineering practice is essential...as a minimum it should be the responsibility of the engineering faculty to infuse professional concepts into *all* [italics mine] engineering coursework." [ABET] Discussions of computer ethics have been integrated throughout the curriculum. In studies done in business ethics courses at the University of Delaware it was proven that this is the most effective style of teaching professional ethics. Many major project courses are used to tie together most of the professionalism issues discussed throughout the curriculum.

The change of focus was identified by [Mason] who defined four critical issues for software development which have become a major focus of computer ethics. These issues stem from the nature of information itself identified by the acronym PAPA standing for Privacy, Accuracy, Property, and Accessibility

A major area of computer ethics had been ignored, *viz.*, professionalism. This changed. Computer professional issues were added to computer science curricula and the Computer Sciences Accreditation Board required the teaching of computer ethics to be an accredited. The ACM Code of Ethics and IEEE codes were modified and placed responsibility for our products to those affected by them over loyalty to employer or professional societies. The stakeholders impacted by the software took precedence over maintaining a professional image. [Gotterbarn 96]. This period was

also marked by the rise of ethics advisory offices within large corporations. Professional standards used in legal decisions. Pop ethics ugly cases are still used but as illustrations of things that the developer could have done to mitigate the impact of those bad efforts rather than mere finger pointing exercises. The sense of professional responsibility had been broadened- not just prevent evil- but facilitate positive values; consider for example the accessibility functions that have been added to computing. For example many could not reboot the first PC keyboard because the reboot key combination was spread across the keyboard. People with less than two usable hands could not reboot the system. People who were visually challenged could not use the system. Now a variety of accessibility functions, such as a magnifier or a narrator which reads the keys as you type letters in, are normal in many operating systems.

Not only did the content change but the methodology changed to address CEH 1- 4. Computer ethics was still taught using cases but criteria were established for them. The example used was important if it met several conditions.

1. It is not told because it is impossible to resolve.
2. It has enough detail to be able to do technical analysis.
3. The main protagonist is not morally bankrupt.
4. It is related to an issue in computing.
5. It can be discussed using moral values.

Computer ethics formalized hand wringing at the litany of computer evils is replaced by an attempt to develop a proactive methodology. The goal is to develop a proactive attitude. The stories should be directly relevant to the class topic.

Goals for computer ethics are now articulated. The pedagogical goals of discussing ethics in the technical curriculum are the development of the following set of skills.

1. The ability to identify correctly the potential for an ethical problem in a particular context, identify what moral rules are being compromised.
2. The ability to identify the cause of these issues, determine several alternate forms of action consistent with morality in that context and for each of these possible actions determine expected outcomes and reasons for taking or not taking that action.
3. The ability to select a workable solution and work through the situation either technically or morally.

The approach to computer ethics underwent a radical transformation in the past 15 years. Although the concept of what should be done is understood, the practice may still be lacking.

The understanding of professional computer ethics was not generalized. We were unsuccessful in inoculating the computing profession from being distracted by the latest technologies from their broader computing professional responsibilities. The Internet arrived in 1994.

3. The Internet and Internet ethics

Looking over the Internet history there is an unsettling familiarity with the story recounted above. One finds an emphasis on issues like cyber-stalking, cyber-rape, Internet pornography, and so on.

Today, ten years into web development, there is a 'new' industry emerging called 'Cyber-ethics'. It, unfortunately, has a strong resemblance to the early stages of 'computer ethics'. Cyber-ethics seems to encompass two sorts of problems. The first set of problems is "dysfunctional human behavior" on the web and includes: flaming, hacking, harassment, misinformation, obscenity, plagiarism, and viruses and worms [Clarke]. The second set conflates legal and ethical issues and equates cyber-ethics with cyber-crime [Cyber sites]. As in the early misconception of computer ethics, this range of cyber-ethics content is irrelevant to the honest Internet developer. Cyber-ethics only addresses the behavior of the malcontents and dishonest developer. It does not help the Internet developer address potential negative impacts of the software. This presumed irrelevance of positive Internet ethics is asserted by this conference which does not even include Internet Professional ethics as a possible subject. The items on the list of interesting subjects for this conference only contains one item that might include professional ethics - malware – which has relevance to the responsibility of web developers. But notice that it is an issue generated by "dysfunctional behavior" with little relevance to the behavioral choices of the moral Internet developer.

This version of Cyber-ethics misdirects us in harmful ways from other significant developments related to the Internet. Since the Nets beginning professional codes of ethics have been developed clearly asserting the responsibilities of Internet developers. The web is run by software we develop and just as avionics software developers have responsibilities to those who ride in the airplane, so we have responsibilities to our web users and those impacted by the web.

Look at simple, non-headline grabbing, example of how poorly we do addressing the professional responsibility of Internet developers. A User of AOL Instant Messenger (AIM) had just undergone a series of eye surgeries and was visually challenged for a few months. This laptop computer user used several accessibility functions to be able to keep on working. Unfortunately the AIM News Ticker could not be enlarged. Believing the claim on AOL's web site that they pride themselves on accessibility, the user contacted AOL's technical support asking that something be done to make the news readable to the visually challenged. The AOL technician told the user to simply select the 'large text option', not realizing that AOL had set, but also locked the text size, so it shows at 800 by 600. Rather than admit that this limited the visually challenged user, the technician's solution to their failing to design an adequate system. The technician ended the discussion saying the only thing they could do was suggest that this user (and all visually challenged users) change the resolution on his screen to 800 by 600. Requiring a whole class of users to change the resolution of their entire computer would be considered a "bug" in any other software. There was a lack of understanding of the responsibility to the user. I am not faulting the technician here. This is just a simple example of the harm caused by the absence of a discussion of professional responsibility. The AOL technician presumed their responsibility ends at the illumination of the computer screen. This is similar to the early confusion about computer ethics which tied the concept of computer ethics to the machine rather than to the practices and behaviors of individuals.

The emergence of the Internet and Internet ethics

But I get ahead of the story. We have to return to those glorious days of yesteryear 1994. Just like the progress of computing described above, the Internet arrived accompanied by promises of great things such as immediate access to information which had been heretofore unavailable and improved democratic processes. An article from the Spectator, Feb. 4, 1995 says

New York.--If last year it was merely modish to be seen speeding down the information superhighway, this year it is fast becoming essential, at least in America. Hitch your wagon to cyberspace, says the new Speaker of the House, Mr. Newt Gingrich, and your democracy will become absolute, with all America joined together for the first time into one vast and egalitarian town meeting.

But this optimistic press did not even last through the first year of the Internet's history. By June of 1995 the Internet CYBERPORN was a Time magazine cover story. This story was based on a report by Martin Rimm [Rimm] which later was judged to be obviously misleading [Godwin]. The impact of this kind of emphasis is similar to CEH4. But there is a significant difference in the degree and impact of this harm. Within days of the publication of this issue of Time, the US Government, based on the assumed truth of this report, proposed the Children's Internet Protection Act to BLOCK Internet material that is harmful to minors.

[\[http://www.fcc.gov/wcb/universal_service/chipact.doc\]](http://www.fcc.gov/wcb/universal_service/chipact.doc)

CEH4 cited some of the difficulties of how this pop-ethics like approach distracted computer professional's from some significant ethical issues. Here we have a corresponding distraction in Internet ethics which is even more dangerous because instead of mere inaction in CEH4 we have legislators being misled INTO action. The attempt to fill these gaps with legislation raises even greater distractions, such as when the New York State legislature made 'virtual' child pornography illegal (pornography which does not involve a real child) in response to the 'baby dancing' animation.

The focuses on the Internet's dark side do not all have questionable sources. The Vatican report on Internet Ethics [Vatican] also focuses on the dangers of the web.

The spread of the Internet also raises a number of other ethical questions about matters like privacy, the security and confidentiality of data, copyright and intellectual property law, pornography, hate sites, the dissemination of rumor and character assassination under the guise of news, and much else.

The Vatican report on Ie also focuses on the system or machine when describing Internet ethics.

An idealistic vision of the free exchange of information and ideas has played a praiseworthy part in the development of the Internet. Yet its decentralized configuration and the similarly decentralized design of the World Wide Web of the late 1980s also proved to be congenial to a mindset opposed to anything smacking of legitimate regulation for public responsibility. An exaggerated

individualism regarding the Internet thus emerged. Here, it was said, was a new realm, the marvelous land of cyberspace, where every sort of expression was allowed and the only law was total individual liberty to do as one pleased.

The report also reiterates that the primary problem is about web content. Schools and other educational institutions and programs for children and adults should provide training in discerning use of the Internet as part of a comprehensive media education including not just training in technical skills—‘computer literacy’ and the like—but a capacity for informed, discerning evaluation of content.

These approaches to Internet ethics repeat the errors of the past. They have the same numbing effect as they did in Computer Ethics. What is the relevance of a story about a person who engaged in the most bizarre forms of cyber-stalking to do the actions of a professional Internet developer?

The misleading focus on criminals who commit fraud with a program in computer ethics moves to a misleading focus on the purveyor of pornography in Ie.

The characterization of the subject of Ie as ‘dysfunctional behavior’ does not help define the professional responsibilities of the internet developer. This sort of description has the same problems as CEH4a

Ie is repeating the mistakes of computer ethics. With few exceptions [Langford, Tavani] Cyber-ethics or Ie is repeating the same mistakes of the early stages of computer ethics. In many contexts, Ie is equated with “cybercrime”

Relatively new terms, "cybercitizenship", "cyber ethics", and "netiquette" refer to responsible cyber social behavior. These terms refer to what people do online when no one else is looking. As our kids go online in increasing numbers, cyber ethics is a critical lesson, especially since poor e-habits can start at an early age. Unfortunately, we are learning all too well that children armed with computers can be dangerous and cause serious damage and harm, regardless of whether they are being mischievous or trying to intentionally commit cybercrimes. [<http://www.cybercitizenship.org/ethics/ethics.html>]

In the popular literature teaching cyber-ethics is what we do with our children
There are four effective approaches for parents who want to ensure their children are doing the right thing online:

- Have a basic understanding of the technology (and the options).
- Participate with your child online.
- Determine what standards have been established for in-school computer use.
- Create, with your child, a set of Rules of the Online Road that clearly establish your household's expectations relating to both ethics and safety.

References to cyber ethics frequently link to <http://www.cybercrime.gov/>. This site tells you how to report (not how to prevent) a cyber-crime. The National Infrastructure Protection center site <http://www.nipc.gov/> has lists of crimes

prosecuted- and interests harmed. Interests include only availability, confidentiality, and integrity. It does not reference professional responsibility

Target - This category indicates whether the computer crime targeted a private individual or corporation or a public governmental agency. It also indicates whether there was a threat to public health or safety:

Threat to public health or safety occurs when a hacker targets or compromises data or a system within the national critical infrastructure (e.g., power grids, air traffic control, classified government data).

When Internet ethics expands beyond the realm of criminal activity it stops at PAPA [Mason] Privacy, Accuracy, Property, and Accessibility. These become the primary issues for Ie [see Braid for example].

The harms of the early limited approach to Computer Ethics are being repeated in Ie.

4. Turning the Corner- again

Replacing Ie with Internet Professional Ethics

There is a positive sense of Internet Professional Ethics which is relevant and which avoids the harms evident in the early stages of computer ethics and prominent in the current work in Internet ethics. Just as in computer ethics, ignoring positive professional responsibilities will lead to significant negative social consequences. After 10 years we are still focused on the newest and the best ways to technically develop and manage Internet applications but we have missed the lesson learned in the early days of computer ethics, namely that it is just as important for a professional to address the question of whether this is the best system to develop because of its social and ethical impact. The Internet professional has responsibility to the broader society.

Lawrence Lessig, Harvard cyber law professor, talks of four legs to the Internet. [Lessig]. In addition to the social and political legs he talks of code as one of the most critical legs. This is a significant change in focus when talking about the various types of responsibility we have when dealing with the Internet. The Internet is run by the software we develop and just as we have responsibilities to those who ride in airplanes our software lands, so we have responsibility to those who interact with sites we design be they users, developers, administrators or those who are harmed by the impact of what we make possible.

What sort of impacts do the choices of the Internet professional have? The professional is supposed to follow ethical practices such as “cause no harm”. Many developers merely focus on the technology and ignore the impacts of their work. I have talked with many internet designers who are not aware that there are interface design templates to help them make good choice in interface design. In many courses the only interface responsibility is “Don’t make it ugly”. The AOL story above illustrates how making inflexible interfaces disenfranchises certain users. It is amazing that this problem of the visually challenged has been addressed by so few developers of voting machine interfaces. But this doesn’t seem to be real harm. The designers assume that their only responsibility is to convey the information. But

interfaces can do real harm. The developers do not address the ethical responsibility to their users who may be dyslexic and will be HARMED by web pages that have bright white background and use fonts with excessive serifs. They do not think of the need for text only versions of the site. [<http://www.dyslexia.com/links.htm>] It is the responsibility of Internet Professional Ethics to motivate them to think of these issues while they are developing.

The emphasis on the latest technology sometimes blinds us to particular ethical issues. Some design changes impede the ability of the disadvantaged to use computers. Shortly after blind users could access the keyboard with Braille, keyboard independent Windows-Icon-Menus-Pointers were introduced [<http://computing-dictionary.thefreedictionary.com/WIMP>]. These visually challenged users were no longer able to use this interface because the only way to click on an icon is to see it first. We need to be aware of subtle decisions that would make use more difficult for people with physical and mental difficulties and those from different cultures. [see Cooper].

5 IPE an agenda

What is it?

Internet Professional Ethics consists of two major elements. One element, called technical ethics, consists of doing a technically competent job at all phases of the software development process, the other element --professional ethics--uses a set of moral values to guide the technical decisions. Such standards are frequently found in codes of ethics.

In general, all professional ethics -- engineering ethics, legal ethics and medical ethics--are only distinguished by the context to which they apply moral rules. We are familiar with these rules and do not have to learn a unique set of ethical rules to do IPE. BUT we do need to think about applying these principles in our development process. We need practice at seeing how these rules fit Internet development. There are, of course, differences in how these rules apply in different contexts. The contexts bring out different ethical problems. Because different contexts raise different ethical concerns, the order in which the moral rules are applied varies depending on where we are in the development process or application domain we are working in. We make a mistake when we teach that one technical solution fits all. Consider the different ways informed consent is applied in different contexts. This rule seems to have different priorities in different stages of development. During the requirements phase of a system to manage life-critical software, informed consent-- understanding agreement from the customer--is an important rule. During testing, principles about not deceiving and not cheating are very important but informed consent is less significant. Internet Professional Ethics not only consists of the context, it is also the order in which the moral rules are consulted. The professional side of Internet ethics is the application of moral rules in Internet development and management.

Professionalism maintains a proactive posture rather than the merely reactive “Oh MY!!” of Ie. We expect software professionals to anticipate and plan for risks. It is hoped that because of the professional's special knowledge that they will avoid many of the risks. The anticipatory approach produces better software more efficiently; the same is true for the ethical, social, cultural, political domain. By adopting this attitude of the

professional one learns to consider issues related to the impact of their software on others and avoid many of the ethical problems that develop in the process of building software artifacts. When properly understood, IPE does not consist of a litany of mistakes that can be made or a collection of stories about immoral developers but IPE is a positive guide to behavior. With this understanding of the way a professional functions, we can see that our current Ie education is incomplete and that we need to include material on professional ethics.

How to do it

The recognition of the need to include this material immediately raises the question of exactly, how it should be taught and what should be included

Teaching

Using the example of professional ethics described above as a model, there is an emphasis on a set of standards accepted by the professional community engaged in Internet development. Following this acceptable standards is an obligation of the professional and it is of little practical consequence whether that is done out of a sense of duty or because one has a contractual relation with a customer.

We should teach how to anticipate and avoid ethical problems within the profession. We are also interested in providing techniques or methodologies which can guide our behavior when a problem does arise. The use of detailed technical examples in the class is a way to develop the skill of anticipating some of these ethical problems.

One can use cases which are less technical to emphasize what I have called the professional side of IPE. There are some issues that can arise at each phase of Internet development. During testing, if funds are exhausted before the testing is satisfactorily completed and there is no possibility of further funds, you have several options. Whichever option you take it must be conditioned by moral rules such as, "don't deceive", "keep promises", and "act professionally." Depending on the type of software being tested, rules like "don't cause pain" and "don't kill" might also come into play. During navigational design, other moral rules might get applied first. For example, consider designing a journal file for a library check-out system to determine the popularity of books and the number of additional copies that should be ordered, if any. The association of the patron's name with the book checked out has a potential for the violation of several moral rules, such as the violation of privacy and the deprivation of pleasure because one does not feel free to read what one wants, and possibly causing psychological pain. In the design phase, the choice of an interface language for a life-critical system can have moral implications. If the language is hard to debug, write, or modify, then one puts people at risk and violates principles of good system design in the choice of that language.

What we want to do is to teach students to transfer moral paradigms to decisions they make as professionals Internet developers. It is important to choose reading material carefully. The point of the reading is to have the students gain an understanding of ethical reasoning within their profession.

Unfortunately many textbooks in Ie are little more than lists of abuses on the Internet. I think these texts create the same dangers as CEH1-4. Ie is presented as a subject which merely deals with proscribed activity -- don't embezzle, don't commit fraud, etc. The

majority of our students do not intend to be crooks so they perceive this as irrelevant to them. They will not take kindly to being constantly equated with bumbling fools or crooks. Material like this does little to forward professional ethics. There is another danger with these "war stories". Because they are fun to tell, we easily fall into the trap of thinking we are discussing Internet Professional Ethics just by telling the story.

The story is important if it meets several conditions.

1. It is not told because it is impossible to resolve.
2. It has enough detail to be able to do technical analysis.
3. It does not deal with a professional who is morally bankrupt.
4. It is related to an issue in the profession.
5. It can be discussed using moral values.

I think it is important to be careful when discussing major Internet disasters. If these are emphasized the student is given the impression that ethical problems will be rare in their lives. Dealing with large issues such as providing Internet spyware to terrorist shifts the emphasis from individual decision making to some form of social philosophy.

Try to develop a proactive attitude. The stories should be directly relevant to the class topic. If we learn to think about the ethical issues before design, then some potential ethical issues may be avoided.

The pedagogical goals of discussing IPE in the technical curriculum are the development of the following set of skills.

1. The ability to identify correctly the potential for an ethical problem in a particular context, identify what moral rules are being compromised.
2. The ability to identify the cause of these issues, determine several alternate forms of action consistent with morality in that context and for each of these possible actions determine expected outcomes and reasons for taking or not taking that action.
3. The ability to select a workable solution and work through the situation either technically or morally.

These are process skills, the emphasis should be on a process that can be applied to changing contexts. These skills, like other abstract skills, are learned by practice. What is needed is practice several times in a course and practice in several Internet development courses. A case study methodology does this best, with each case addressing one or more specific areas of Web development.

I think the introduction of this material is necessary if we as educators are to be responsive to the needs of the Internet community and avoid the harms of Ie.

The way you build the Internet and the choices made in that building facilitates and exacerbates the ethical problems.

The primary goals of IPE are:

1. to get the designers to the internet developers to think critically about these issues as they are doing the development. Just like any other project development the developer needs to identify a broad range of risks.

2. adjust the product developed to mitigate the risks like any good development. IPE requires a consideration of a range of stakeholders which is broader than the e-business model which limits stakeholder consideration to the customer and the developer.

3. to provide tools to help them such as Interface templates for the disadvantaged.

4. to make developers aware that all of their decisions are value based and to think about those values when they make decisions. The value free mythology has returned-assumed but unspoken. We should not treat tools we develop as value free.

6 Conclusion

What now?

There are two significant tasks needed as preparation to introduce this material into the professional/technical curriculum. The first task is the preparation of materials which start with a clear concept of IPE showing how, within the context of professional ethics, sound ethical decisions can and must be made. The second task is a concerted research effort to clearly articulate the values that drive good Internet development practices. These can then be used to help guide the professional decisions of Internet developers.

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Disabilities-The US Americans with Disabilities Act demands that employers "reasonably accommodate the disabilities of employees" and that all public facilities be accessible to individuals with disabilities

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