

## Introduction to Software and Computer Ethics

This material adapted from:

"The Practical Management of Computer Ethics Problems", John W. Smith, ACM SIGUCCS Newsletter, 24(1), April, 1994.

**Computers, Ethics & Society**, M. David Ermann, Mary B. Williams, and Claudio Gutierrez, Oxford, New York, 1990.

## Definitions

- Webster's definition
  - The discipline dealing with what is good and bad with *moral* duty and obligation.
  - A set of *moral* principles or values.
  - The principles of conduct governing an individual or group.
- Key word is *moral*.

## Moral

- What does that mean?
  - of or relating to principles of right and wrong *behaviour*
  - expressing or teaching a conception of right *behaviour*
  - conforming to a standard of right *behaviour*
  - sanctioned by or operative on one's *conscience* or ethical judgment
- Keys are right *behaviour* and *conscience*.

## But What is Right Behaviour?

- There are three classes of rules, governing behavior:
  - Legal
  - Moral
  - Courtesy
- *Courtesies* are the weakest set of rules. Things we do to be nice. If we don't do them it is not a very big deal.

## But What is Right Behaviour?

- Legal Rules are the strongest.
  - Penalties include freedom restricting, financial, or even loss of life (in some countries).
- Moral Rules lie somewhere in the middle.
  - Not as formally defined as laws, but more serious consequences than courtesies. This is ethics.
- Usually, it's hard to draw the lines between these three categories.

## There are 5 Basic Things at Stake

- Feelings
  - internal, personal, but not based upon established social components
- Beliefs
  - external (e.g. politics, religion, etc.)
- Reputation
  - what others think about you (especially if they don't know you)

## There are 5 Basic Things at Stake

- Ability
  - keeping you from being able to do something (especially information, knowledge, education...)
- Property
  - ownership
  - individual's rights versus greater good
  - especially difficult if property is intellectual rather than real

## What is at Stake

- Sometimes, more than one of these are present in the same problem, either on opposite sides, or sometimes one underlying another.
- Often there is also a conflict between individual good versus greater good of an organization or society.

## Categories

- There are all sorts of ethics problems, and every problem is unique, however, it is possible to identify certain categories of problems that occur often and can be addressed in a general discussion.

## Personal Intrusion - Email

- It is easy to send rude and insulting notes directly (anonymously) to a person. It is both instant and in writing! The writer can send a message in almost no time (shooting from the hip) and the recipient can read it over and over again.

## Personal Intrusion - Email

- The question is when does the intensity or rate of messages become discourteous versus unethical versus illegal?
  - Does the recipient have to complain?
  - Sender may think it is funny, receiver thinks it is harassment.
  - Sometimes it is obvious: sexual connotations + power imbalance = legal case.
  - Threats: exposure and violence. Is it serious, or just posturing?

## Public Posting

- Bulletin board, net-news can contain attacks on an individual or a class of people.
  - Free speech versus rights of the individual.
  - False statements on a public board.
  - Public versus private figures: student versus the university president.
  - Unavoidable exposure to information: Nudie pics as screen background. Swimsuit issue as screen background? Real art?

## Public Posting

- Questions
  - Who's to blame, computer centre or individual?
  - Flame war, then one person wants to call it off?
  - Voluntary involvement in subculture known for extreme behavior, then things get too rough?
  - Need to understand people involved to interpret communications.

## Privacy

- Two Perspectives
  - individuals (organizations) have right to see information about others versus
  - individual (organization) has a right to keep information about themselves private.
- Two perspectives result in ethical conflict.

## Open Access Environment

- Is it fair for me to look at your *.login* file (without your permission)?
- Is it fair for me to look at your *mbox* file (without your permission)?
- Is it fair for anyone to look at any file with read permission turned on?
- Does a supervisor (professor) have a right to look at a subordinate's (student) files.

## Open Access Environment

- Other information: login/logout times, resource utilization, process activity, keystroke history?
  - Are these different than files?
- What if there's an emergency?

## System Administrator

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- What about the system administrator?
  - Can they look at user files if there is a clear and present danger to computing environment? Suspicion of a threat?
  - If the sys-admin finds evidence of immoral activity can they share that information?
  - What if illegal activities are being engaged in on the system?

## System Administrator

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- Is the sys-admin ever responsible for what his/her users do?
- Is it ok to run search programs to look for pirated software?

## Morality

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- Morals vary from society to society.
- What do we do in a multi-ethnic, culturally diverse, multi-national electronic society?
- These factors can make it difficult to find common ground from which to make decisions.
- Is morality a personal choice, or something that should be regulated for others?

## Deception

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- Three forms of deception
  - misidentification (impersonation)
  - misattribution (plagiarism)
  - misinformation (lying)

## Misidentification

- Spoofed mail is common.
  - Not difficult to do.
  - Experienced users know that e-mail from Jean Chretien is probably fake.
  - Can cause confusion, harm a person's reputation, take time to rectify.
- Anonymity - Is this a right? What about accountability? Is it needed?

## Misattribution

- Includes plagiarism, copying or test cheating, usually not of special significance to computing and there are standard rules governing these. But...
  - If a faculty member suspects cheating can she gain access to files of students (e-mail)?
  - Would it be ethical for the computing center to create and run a daemon that compares the contents of students files, looking for identical works?

## Misinformation

- To what extent is an individual or organization responsible for finding false information and removing it?
  - If false information appears in a local news group should the sys-admin notify people of its falseness? Remove it?
  - Are they allowed to do this? Do they have to do this? What if we are talking about a misspelled name, bad data in an experiment, wrong chemical formula?

## Misinformation

- Misleading or incomplete information is often used as a way of achieving goals or avoiding conflict.
- Cause of misinformation: carelessness, ignorance or malice.
- Context
  - In the Linux news group, "windows95 isn't an operating system, its a virus!" versus in alt.viruses, "the program XXX is (contains) a virus".

## Security

- Hacking into a system, destroying files and making it unusable is obviously unethical (in most cases).
- But what about just breaking in? This might be a good thing if it exposes weaknesses in the system's security.
- What about password cracking? Is it ok as long as the found password is not used? (Password cracking).

## Security

- What if there's a terminal where someone forgot to logout? Is it ok to snoop around?
  - `rm -fR *` ?
  - `mv -R * .you_should_remember_to_log_out?`
- Is it ok to create a harmless virus or worm?
  - Is it unethical to possess a worm, virus, or password cracking software if you don't use it?

## Obligations

- What are the obligations of the users?
  - Is it ok to exploit weaknesses?
  - Do you have to tell someone?
  - Are you allowed to tell anyone.
  - What if the sys-admin refuses to fix it?
- Motivation is usually a key issue here. If there is malicious intent we tend to react severely.

## Resources

- Scarce but shared resources
  - How many copies can I print?
  - How big a document can I print?
  - Is it ok for me to log into the modem pool and not do anything for 1/2 hour just so I don't lose my modem connection?
  - Is it ok to set my modem to dial in and keep redialing, so whenever I decide I need it, I'm logged on? Should everyone get an equal share?

## Intellectual Property

- Software piracy.
- Who owns an idea that originated out of a newsgroup discussion?
  - When does an idea become common knowledge?
- How does one cite information that no-longer exists? From a web-site that no-longer exists, on a machine that no-longer exists?

## Intellectual Property

- Is it ethical to search out software pirates?
  - If so how?
- Is making a copy of information stealing or creating?
  - Napster, Gnutella

## Inappropriate Use

- Chain letters, game playing, account sharing?
  - Do these really tax limited resources?
  - Who owns the resources?
  - What rights do they have to control them?
  - What about game playing on a student owned computer, over the university owned network?
  - Is it appropriate for a faculty member to allow their spouse and children to use their university account?

## Ethics of Technology

- Is technology ethical or unethical (or only its application)?
  - Is the creator of a technology responsible for its use?
- What are our obligations to create and deliver products and services that work as expected.
  - Do we have a responsibility for letting people know what it will cost to support a technology once they are hooked?

## The Ten Commandments of Computer Ethics

By the Computer Ethics Institute

### The First Five...

1. Thou shalt not use a computer to harm other people.
2. Thou shalt not interfere with other people's computer work.
3. Thou shalt not snoop around in other people's computer files.
4. Thou shalt not use a computer to steal.
5. Thou shalt not use a computer to bear false witness.

### The Next Four...

6. Thou shalt not copy or use proprietary software for which you have not paid.
7. Thou shalt not use other people's computer resources without authorization or proper compensation.
8. Thou shalt not appropriate other people's intellectual output.
9. Thou shalt think about the social consequences of the program you are writing or the system you are designing.

### And the last one...

10. Thou shalt always use a computer in ways that insure consideration and respect for your fellow humans

## IEEE Ethics Committee

## IEEE Ethics Committee

- These cases came to the attention of the IEEE Ethics Committee during the past few years.
- Most came in via the ethics hotline, while the initial contacts for others was via communications addressed to authors of ethics columns that appeared in the IEEE Institute.

## IEEE Ethics Committee

- Most of these cases have not been carefully investigated, although the IEEE Ethics Committee is fairly confident that the essential information is correct.
- The outcomes of most of the cases are not yet known--in some cases matters are still in a state of flux.
  - Names and other information that might identify individuals or organizations have been suppressed or fictionalized.

## Using Other People's Software

- Jim Warren was a senior software systems expert, hired by NewSoft, a start-up company, to help in the development of a new product.
- He soon learned that the product was based on proprietary software for which NewSoft did not have a license.

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- Jim assumed that this was some sort of mistake and spoke to the company president about the matter.
  - He was assured that the situation would be rectified. But time passed and nothing happened except that Jim found other instances of the same practice.

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- Repeated efforts to get NewSoft to legalize its operations failed and Jim, after threatening to notify the victimized companies, was discharged.
  - Law enforcement officials were brought into the picture and lawyers on all sides began negotiating.

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- At this date it is not clear whether criminal charges will be filed. There appears to be a strong possibility of some sort of out-of-court settlement among the companies involved. It is not clear how this will ultimately affect Jim Warren.

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## Intensive Care

- George Ames, a young software engineer worked for a hospital computer department. He was assigned to work with the people in the intensive care unit (ICU).
- The computer group was working on the interface between a piece of commercial data processing software and various units in the ICU, including real-time patient monitoring devices.

- From the manager down, the computer group was not technically up to the mark in experience or in education. They were falling significantly behind schedule.
- George learned that they were seriously considering cutting back on testing in order to close the schedule gap.
- Appalled at this idea, George argued strongly against it.

- In this case, his arguments had some effect, but he was nevertheless given the clear impression that his prospects with this organization were now significantly impaired.
- Apparently, part of the problem had to do with a reluctance on the part of higher management to clash with the physician who headed the computer group.

- George felt that the basic problem was incompetence and he did not see how he could be effective on his own in combating it.
- About six months later, he resigned.

## Ethics Scenarios

The following scenarios are works of fiction but they serve to stimulate thought about ethical issues in the software industry.

## Internet Privacy Scenario I

- Three years ago Diane started her own consulting business.
- She has been so successful that she now has several people working for her and many clients.
- Their consulting work includes advising on how to network microcomputers, designing database management systems, and advising about security.

- Presently she is designing a database management system for the personnel office of a medium-sized company.
- Diane has involved the client in the design process, informing the CEO, the director of computing, and the director of personnel about the progress of the system.

- It is now time to make decisions about the kind and degree of security to build into the system.
- Diane has described several options to the client.
- Because the system is going to cost more than they planned, the client has decided to opt for a less secure system.

- She believes the information they will be storing is extremely sensitive. It will include performance evaluations, medical records for filing insurance claims, salaries, and so forth.
- With weak security, employees working on microcomputers may be able to figure out ways to get access to this data, not to mention the possibilities for on-line access from hackers.

- Diane feels strongly that the system should be much more secure.
- She has tried to explain the risks, but the CEO, director of computing and director of personnel all agree that less security will do.
- What should she do?
- Should she refuse to build the system as they request?

## Internet Privacy Scenario II

- A commercial network operator collects information about the interests and purchases of its users by keeping track of the forums and bulletin boards they use and the purchases they make; it then sells this information to other merchandisers.
- Users are not asked if they wish to participate in redistribution of such information.

## Questions

- To what extent are such practices permitted today under existing laws and codes of behavior?
- What constitutes “informed consent” for the user to agree to the redistribution of personal information?
- For example, is it sufficient to give users the option of not participating in the redistribution of personal information?

- May users be offered financial incentives (e.g., reduced rates for using the system) if they agree to participate?
- How comprehensively should possibilities be described to users to illustrate the ramifications of redistribution?
- How are secondary and tertiary redistribution to be controlled, if at all?

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- Once users have granted permission for redistribution, should they have the option to revoke it?
  - How does revocation apply to secondary and tertiary uses?

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- With what granularity should various characteristics (e.g., cigarette and alcohol purchases, regular sign-ons to the gay and lesbian bulletin board) be associated with the user?
    - At one extreme, the individual is in a group of one. At the other, every user of the service is a member of the group.

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- How is this situation similar to and/or different from supermarkets that track customer purchases and preferences through scanners and check cashing, credit cards, and personalized coupons?