Lecture 8: Professional Ethics

(Some slides are from M. Quinn, *Ethics for the Information Age*, Pearson © 2013.)

Lecture Overview

- Introduction
- Are Computer Experts Professionals?
- Software engineering code of ethics
- Analysis of the code
- Case studies
- Whistleblowing

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Introduction

- Informally, profession a vocation requiring…
  - High level of education
  - Practical experience
- We pay professionals well
  - Doctors
  - Lawyers
- We trust professionals to…
  - Correctly ascertain and treat problems
  - Take actions for the good of their clients

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Are Computer Experts Professionals?

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Characteristics of a Profession

- Initial professional education
- Accreditation
- Skills development
- Certification
- Licensing
- Professional development
- Code of ethics
- Professional society

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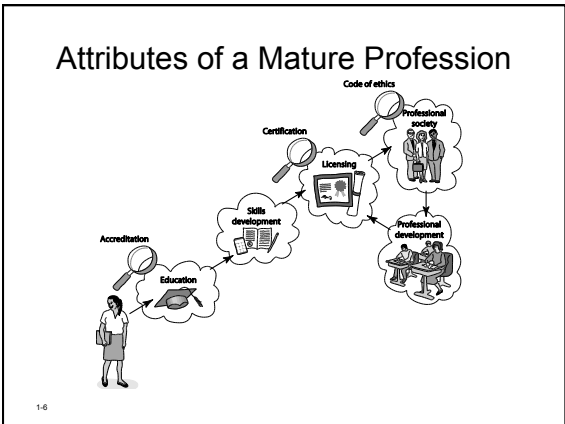## Attributes of a Mature Profession

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Certified Public Accountants

- Bachelor's degree
  - 150+ semester hours
  - 24+ hours of accounting-related classes
- Two years' experience working under supervision of a CPA
- CPA exam
- To retain certification
  - Continuing education
  - Follow code of ethics

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Computer-Related Careers

- Certification and licensing not required
- College degree not required
- Apprenticeship not required
- Membership in professional society optional
- No specific requirements for continuing education
- Most computer programmers, system analysts, etc. are part of teams
- ***Ability to harm public can be similar to members of mature professions***

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Association for Computing Machinery (ACM) Code of Ethics

<http://www.acm.org/about/code-of-ethics>

General Moral Imperatives

- As an ACM member I will ....
- 1.1 Contribute to society and human well-being.
- 1.2 Avoid harm to others.
- 1.3 Be honest and trustworthy.
- 1.4 Be fair and take action not to discriminate.
- 1.5 Honor property rights including copyrights and patent.
- 1.6 Give proper credit for intellectual property.
- 1.7 Respect the privacy of others.
- 1.8 Honor confidentiality.

What is a moral imperative?

- Obligation to act in a certain way
  - Law-based
  - Agreement-based
    - Promise keeping
  - Moral principle-based

ACM/IEEE
Software Engineering Code of Ethics

<http://www.acm.org/about/se-code#full>

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Preamble of Code

- Software engineers have opportunities to do good or do harm
- Software engineers ought to be committed to doing good
- Eight principles identify key ethical relationships and obligations within these relationship
- Code should be seen as a whole, not a collection of parts
- Concern for the public interest is paramount

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Eight Principles Identify Morally Responsible Relationships

1. Public Interest
2. Client's and employer's Interest
3. Product meet highest standards
4. Integrity in Professional Judgment
5. Effective Project Management
6. Advance the Profession
7. Fair and supportive of Colleagues
8. Partake in Professional Development

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Act Consistently with Public Interest

1.01 "Accept full responsibility for own work"
1.02 Balance competing interests
1.03 Approve software only if it is safe
1.04 Disclose actual/potential dangers
1.05 "Cooperate in efforts to address" public concerns
1.06 "Be fair and avoid deception in all statements"
1.07 Consider factors that diminish access to software
1.08 "Volunteer professional skills to good causes"

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Clause 1.03: Approve Software Only If It Is Safe

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Act in Best Interest of Client, Employer

2.01 Act within areas of competence

2.02 Don't use software obtained illegally

2.03 Only use property in authorized ways

2.04 Ensure documents are approved

2.05 Respect confidentiality

2.06 Promptly report problems with project

2.07 Report issues of social concern

2.08 Refuse outside work detrimental to job

2.09 Put employer's/client's interests first, unless overriding moral concern

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Clause 2.02: Don't Use Software Obtained Illegally

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Ensure Products Meet Highest Standards

3.01 Aim for "high quality, acceptable cost and a reasonable schedule," making trade-offs clear

3.02 "Ensure proper and achievable goals"

3.03 Face up to "ethical, economic, cultural, legal and environmental" issues

3.04 Ensure you are qualified for proposed work

3.05 Use appropriate project methodologies

3.06 Follow the most appropriate professional standards

3.07 "Strive to fully understand the specifications"

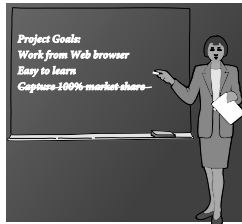**3.08** Ensure the specifications are correct and approved

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Clause 3.02
"Ensure Proper and Achievable Goals"

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Ensure Products Meet Highest Standards

3.09 "Ensure realistic quantitative estimates of cost, scheduling, personnel, quality and outcomes"

3.10 "Ensure adequate testing, debugging, and review of software and related documents"

3.11 "Ensure adequate documentation"

3.12 Develop software and documents that respect privacy of those affected by software

3.13 Use only accurate data appropriately acquired

3.14 Maintain data integrity

3.15 Use same standards for software maintenance as software development

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Maintain Integrity in Professional Judgment

4.01 "Temper all technical judgments by the need to support and maintain human values"

4.02 Understand and agree with documents before endorsing them

4.03 Remain objective when evaluating software or related documents

4.04 Do not engage in deceptive financial practices

4.05 Disclose conflicts of interest

4.06 Do not participate in decisions in which you, your employer, or your client has a potential conflict of interest

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Promote Effective Project Management

5.01 Ensure good project management procedures

5.02 Ensure software engineers know standards

5.03 Ensure software engineers know policies and procedures for protecting confidential information

5.04 Take employees' abilities into account before assigning work

5.05 Ensure reasonable estimates are made

5.06 Give full and accurate information to potential employees

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Promote Effective Project Management

5.07 Pay employees fairly

5.08 Do not unjustly prevent a qualified person from taking a job

5.09 Work out fair intellectual property agreements

5.10 Provide employees charged with misconduct due process

5.11 Do not ask someone to do anything violating the Code

5.12 "Do not punish anyone for expressing ethical concerns about a project"

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Advance the Profession

6.01 Help create an environment supporting ethical conduct

6.02 "Promote public knowledge of software engineering"

6.03 Participate in professional activities

6.04 Support others who are trying to follow this Code

6.05 Do not promote self-interest at expense of profession, client, or employer

6.06 Obey all laws unless there is an overriding public interest

6.07 Do not deceive others regarding the characteristics of software

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Clause 6.01: Help Create An Environment Supporting Ethical Conduct

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Advance the Profession

6.08 Take responsibility for finding, correcting, and reporting errors in software and documentation

6.09 Ensure others know you are committed to the Code and what that means

6.10 Do not associate with businesses and organizations that are in conflict with Code

6.11 Understand violating the Code is inconsistent with being a professional

6.12 Share concerns about Code violations with the people involved

6.13 "Blow the whistle" when no alternative to reporting significant Code violations

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Be Fair to and Supportive of Colleagues

7.01 "Encourage colleagues to adhere to this Code"
7.02 "Assist colleagues in professional development"
7.03 Give others the credit they deserve
7.04 Be objective when reviewing the work of others
7.05 Give colleagues a fair hearing
7.06 Help colleagues remain aware of work practices
7.07 Do not unfairly interfere with another's career, but protect the public interest
7.08 Bring in experts for situations outside your own area of competence.

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Participate in Lifelong Learning

8.01 Stay current with developments in field
8.02 Improve ability to create high quality software
8.03 Improve ability to produce high quality documentation
8.04 Improve understanding of software and documentation used in work
8.05 Improve knowledge of relevant standards
8.06 Improve knowledge of this Code and its application
8.07 Do not treat others unfairly because of prejudices
8.08 Do not influence others to break the Code
8.09 "Recognize that personal violations of this Code are inconsistent with being a professional software engineer"

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Clause 8.02:   Improve Ability to Create High Quality Software

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Analysis of ACM/IEEE Ethics Codes

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Analysis of Preamble

- No mechanical process for determining if an action is right or wrong
- Should not take an overly legalistic view of the Code
  - If Code doesn't forbid something, that doesn't mean it is morally acceptable
  - Judgment required
- Code reflects principles drawn from multiple ethical theories

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Strengths of Virtue Ethics

- Provides a motivation for good behavior
- Provides a solution to the problem of impartiality
  - Some virtues are partial (e.g., generosity)
  - Other virtues must be impartial (e.g., honesty)

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Case Studies

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Case: Software Recommendation

- Sam Shaw asks for free advice on LAN security
- Prof. Smith answers questions and recommends top-ranked package
- Prof. Smith does not disclose
  - She has financial interest in company producing top-ranked package
  - Another package was given a "best buy" rating
- Did Prof. Smith do anything wrong?

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Analysis

- Most relevant principles
  - Be impartial.
  - Disclose information others ought to know.
  - Share your knowledge, expertise, and values.
- Clause 1.06: Prof. Smith was deceptive
- Clauses 1.08, 6.02: Prof. Smith freely gave valuable information
- Clauses 4.05, 6.05: Prof. Smith did not reveal conflict of interest

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Conclusion

- Professor Smith should have revealed her conflict of interest to Mr. Shaw.

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Case: Child Pornography

- Joe Green a system administrator
- Asked to install new software package on Chuck Dennis's computer
- Green not authorized to read other people's emails or personal files
- Green sees suspicious-looking file names
- He opens some of Dennis's files and discovers child pornography
- What should he do?

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Analysis (1/2)

- Most relevant principles
  – Be impartial
  – Respect the rights of others
  – Treat others justly
  – Maintain your integrity

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Analysis (2/2)

- Most relevant clauses
  - 2.03: Somebody has misused the company PC
  - 2.09: Someone is using the PC for a purpose not in the employer's interest
  - 3.13: Joe violated the policy against opening files
  - 5.10: Someone else may have planted the files on Chuck's computer

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Legal Reporting Requirements

- **http://www.ncsl.org/issues-research/telecom/child-pornography-reporting-requirements.aspx**
- **Child Pornography Reporting Requirements for Computer Technicians and Information Technology Workers**
- As of January 24, 2013
- Nine states--Arkansas, California, Illinois, Missouri, North Carolina, Oklahoma, Oregon, South Carolina, and South Dakota—have laws requiring computer technicians or information technology workers to report child pornography if they encounter it in the scope of their work. The laws don't require technicians or service providers to search for the illegal material, only to report it if they find it. Michigan law provides confidentiality and immunity from civil liability for computer technicians who report child pornography encountered in the scope of their work.

- Critics charge that this type of law unfairly transfers law enforcement duties to individuals who may not be qualified to handle evidence or determine what constitutes child pornography. Supporters say reporting mandates for photo labs have proven effective, and that similar laws for IT workers will help combat child pornography on the Internet.

Conclusions

- Joe was wrong to violate company policy to uncover child pornography
- Once he has this knowledge, however, he is obliged to share it with company authorities and legal authorities
- Joe should be discreet

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Case: Anti-Worm

- Internet plagued by new worm that exploits hole in popular operating system
- Tim Smart creates anti-worm that exploits same security hole
- Tim's anti-worm fixes PCs it infects. It also uses these PCs as launch pad to reach new PCs.
- Tim launches anti-worm, taking pains to keep it from being traced back to him.
- The anti-worm quickly spreads through Internet, infecting millions of computers
- System administrators around the world combat the anti-worm

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Analysis (1/2)

- Most relevant principles
  - Continually improve your abilities.
  - Share your knowledge, expertise, and values.
  - Respect the rights of others.
  - Take responsibility for your actions and inactions.

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Analysis (2/2)

- Most relevant clauses:
  - 1.01: Tim did not accept responsibility for his action.
  - 1.08: The worm was free, but cost system administrators a lot of time.
  - 2.03: The anti-worm entered computers without permission of their owners.
  - 8.01, 8.02, 8.06: Tim improved his knowledge and skills by creating the anti-worm.

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Conclusions

- Tim's welfare is less important than the public good
- By attempting to hide his identity, Tim refused to accept responsibility for his actions
- Tim violated the property rights of the PC owners whose systems were infected by his anti-worm
- Tim violated the Ethics Code

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Case: Consulting Opportunity

- Jean works in support organization for Acme Corporation
- Many Acme customers downgrading their level of support
- East Dakota gives Jean opportunity to run a training class similar to that provided by Acme
- Jean tells no one at Acme
- Jean develops materials at home on own time
- Jean takes paid vacation to teach class

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Analysis (1/2)

- Most relevant principles
  – Be impartial.
  – Take responsibility for your actions and inactions.
  – Disclose information that others ought to know.
  – Maintain your integrity.
  – Continually improve your abilities.

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Analysis (2/2)

- Most relevant clauses
  - 3.04: Jean was well qualified to develop materials and teach class
  - 8.04: By creating materials, Jean became even more familiar with Acme's package and its capabilities
  - 4.05: Jean didn't disclose his conflict of interest with his employer
  - 2.08: Jean deprived himself of "time off" needed to do his best work at Acme
  - 6.05: Jean put his own interest above that of his employer

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Conclusions

- Jean did not disclose East Dakota's offer or his decision to Acme's management
- Acme's management is likely to question Jean's loyalty to the company
- Jean's actions were wrong and unwise

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Whistleblowing

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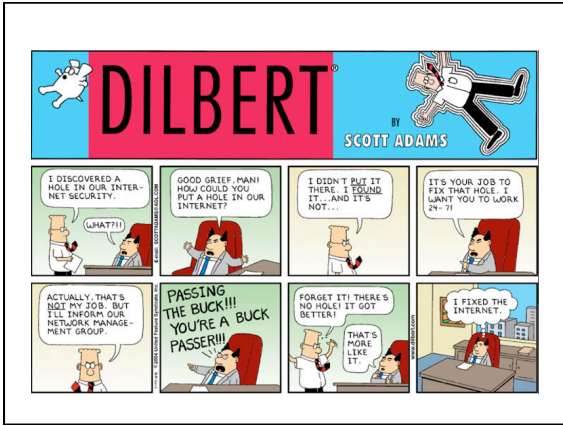
Overview of Whistleblowing

- Whistleblower
  - Tries to report harmful situation through authorized channels
  - Rebuffed by organization
  - Makes disclosure through unauthorized channels
- Whistleblowers sometimes punished for their actions
  - Lose job or all chances of advancement
  - Financial and emotional hardship
- False Claims Act
- Whistleblower Protection Act

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The *Challenger* Explosion Killed Seven Astronauts

Courtesy of NASA

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Case: Morton Thiokol/NASA

- *Challenger* explosion 1986
- Roger Boisjoly and *Morton Thiokol* engineers documented dangers of low-temperature launches in 1985
  - *Morton Thiokol* executives and NASA officials overrode and hid concerns
- Boisjoly shared information with Presidential commission
- *Morton Thiokol* retaliated
  - Boisjoly took medical leave for stress, then quit
  - Found job as a consultant two years later

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Case: Hughes Aircraft

- Factory for military-grade hybrid chips
- 1985 Some defective chips being approved
  - 1985 Ruth Goodearl reported incidents to upper management
  - 1986 Ruth Goodearl reported incidents to government
- Consequences for Goodearl
  - Harassed
  - Fired
  - Unemployment
  - Bankruptcy
  - Divorce
- 1990 Goodearl and Ruth Aldred sued Hughes Aircraft under False Claims Act and won

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Motives of Whistleblowers

- People become whistleblowers for different reasons
- Morality of action may depend on motives
- Good motive
  - Desire to help the public
- Questionable motives
  - Retaliation
  - Avoiding punishment

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Corporate Response to Whistleblowing

- Whistleblowers are disloyal
- Whistleblowing has many harms
  – Bad publicity
  – Disruption of organization's social fabric
  – Makes it hard for people to work as team
- If company causes harm, public can use legal remedies to seek damages
- Critique: Overly legalistic view of public harm?

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Whistleblowing as Organizational Failure
- Whistleblowing harms organization
  – Bad publicity
  – Ruined careers
  – Erodes team spirit
- Whistleblowing harms whistleblower
  – Retaliation
  – Estrangement
- Organizations should improve communication
- Critique
  – Is this realistic?
  – Robert Spitzer: Organizations should return to using principle-based ethics in decision making

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Whistleblowing as Moral Duty

Richard DeGeorge's questions for whistleblowing
1. Is serious harm to the public at stake?
2. Have you told your manager?
3. Have you tried every possible inside channel?
4. Do you have persuasive documented evidence?
5. Are you sure whistleblowing will work?

Under what conditions must you blow the whistle?
  – DeGeorge: If all five conditions are met
  – Others: If conditions 1-3 are met
  – Still others: Whistleblowing is *never* morally required

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Moral Responsibility

- Exclusive Responsibilities
  - Role responsibility
  - Causal responsibility
  - Legal responsibility
- Moral responsibility
  - Must be borne by people
  - Is not exclusive
- Michael McFarland: A team should be held to a higher level of moral responsibility than any of its members

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